

THE RAILWAY GAZETTE
A Journal of Management, Engineering and Operation
INCORPORATING
Railway Engineer • TRANSPORT • The Railway News
The Railway Times • Herapaths Railway Journal
RAILWAYS ILLUSTRATED • ESTABLISHED 1835 • RAILWAY RECORD • RAILWAY OFFICIAL GAZETTE

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Annual subscription £3 10s. 0d. post free. Single copies, One shilling & sixpence
Registered at the G.P.O. as a newspaper. Entered as second-class matter in U.S.A.

Vol. 94]

FRIDAY, JANUARY 19, 1951

[No. 3

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Train Cancellations and Coal Economy

THE services selected for temporary suspension last week by the Regions of British Railways in compliance with the Railway Executive order to implement the Government's request to save coal by a 4 per cent. cut in mileage were, as might be expected, the more lightly loaded main-line, branch, and interurban passenger trains. Most of these had been selected some time ago for cancellation in the event of a coal shortage; and most are of Regional significance only; publication of details has been left to the Region concerned. The few exceptions are cross-country services, such as the Birkenhead-Ramsgate and Newcastle-Bournemouth through trains, which depend largely on summer holiday traffic. No important electric service is affected, and intensive steam suburban services, such as the Tilbury line of the Eastern Region, have been slightly reduced by judicious thinning-out during slack hours. In the Midlands and North, certain off-peak hour interurban services have been withdrawn. Economy in branch-line train-mileage takes the form mainly of reduced Sunday and slack-hour services, though one or two local services, such as that between Plymouth and Turnchapel, have been withdrawn entirely—and probably will never be resumed, as there are alternative road services. Although some operating problems little appreciated by the public, such as the working of vans and other vehicles normally worked by the suspended trains, and the carriage of parcels, may arise from the cancellations, the inconvenience to the public, compared with the saving in coal, will be insignificant. The cancellations announced are

expected to effect all the coal economies so far required of British Railways, though one or two Regions may make further cuts next week. It has been remarked that even since nationalisation the coal consumption per engine-mile in the Scottish—(allowing for the climatic factor, but bearing in mind the high proportion of former L.M.S.R. engines there)—and London Midland has been higher than that in other Regions. With L.M.S. ideas predominant in British Railways locomotive design, it will be interesting to watch the coal consumption of the new standard types as they appear.

Mr. A. Collingwood Lermitt

MR. A. COLLINGWOOD LERMIT'S retirement for health reasons from the position of Works Secretary, the Vulcan Foundry Limited, has removed a popular figure from active participation in British locomotive manufacturing affairs. For 43 years he has played an unobtrusive but valuable part in the management of the Vulcan Foundry Limited; he joined the company in 1907 as Assistant to the then Works Secretary, whom he succeeded in 1910. His interests have been wide and in particular he has given much of his time and energy to the welfare and social activities of the company's employees. Mr. Lermitt has served under the leadership of four outstanding personalities, who have directed the affairs of the company—Sir William Collingwood, Mr. R. P. Richards, Mr. F. S. Whalley and Mr. G. Collingwood. He has also taken an active part in the affairs of the Locomotive Manufacturers' Association of Great Britain as representative of the Vulcan Foundry Limited at L.M.A. meetings; he had also served on various sub-committees.

An Offer for the G.N.R.(I.)

THE Governments of the Republic and Northern Ireland have offered £3,900,000 in cash for the joint purchase of the Great Northern Railway (Ireland) as from January 1, 1951. The offer is subject to the approval of both Parliaments and to the stockholders of the company. To the latter it has come as a shock, for they had expected far better terms. The price is based on the Stock Exchange value of the stocks in 1948, 1949, and 1950, without reference to the break-up value of the undertaking, which both Governments have assessed at more than £10,000,000. One of the major reasons for the low level of G.N.R.(I.) stock values for the last two years has been the uncertainty as to the future of the company, resulting from the refusal of the Governments to give any lead as to their intentions. The offer for the G.N.R.(I.) is in striking contrast to the generous treatment accorded C.I.E. stockholders by the Dublin Government last year. The adoption of stock exchange quotations as a basis of valuations is the more strange because of the opprobrium attaching to this method after its adoption by the British Government for the acquisition of the British railways in 1948. It is reported that the G.N.R.(I.) Stockholders' Protection Association is inclined to advise rejection of the offer. That view is understandable, but it is not clear whether the alternative to acceptance is arbitration.

The London Goods Depot Strike

NO rational process of thought can have caused British Railways cartage workers at certain London goods stations to strike unofficially, as related elsewhere in this issue. Their jobs are not threatened. The traffic, to the handling of which at terminals by Road Haulage Executive men they object, is additional to existing traffic, and therefore creates work at least for some railwaymen; and without such traffic the financial position of the railways would mean dismissals all round. This was officially explained to the men when the new terminal traffic arrangements were agreed by the Railway and Road Haulage Executives and the National Union of Railwaymen. Moreover, railway manpower shortage would enable any displaced men in London or any other large centre to be given other work near home. But even if unemployment were caused by transport integration or other steps to enhance efficiency,

this is the price to pay for a measure long sought by the unions. In this instance, despite the recent efforts of the N.U.R. to end the strike, the fact of an unofficial strike says little for the relations between some members and union headquarters; nor does the latter seem to have done all it could to explain to its members the inevitable consequence of nationalisation, or their resultant responsibilities. The Railway Executive has agreed to postpone the application of the new integration arrangements; meanwhile, traffic is seriously delayed.

Position of the Steel Industry

THE production of certain forms of iron and steel, defined as the working and getting of iron ore and the production of ingot steel and its hot rolling, will be restricted except under licence or in small quantities to the Iron & Steel Corporation as from May 15 this year. This was the substance of an official statement by the Ministry of Supply on Monday and it leaves no doubt that the Government is pressing on with its plans to control steel. While the present problems arising from an exceptional demand for iron and steel—principally due to heavy rearmament programmes—cannot be avoided, there could hardly be a more inappropriate moment to disrupt the smooth working of an industry on which the country now depends so much. There has been no serious labour dispute in the steel industry for many years and there is little enthusiasm for its nationalisation even in labour circles at the present time. With an output of 16,292,700 tons in 1950, the industry exceeded the upper limit of the target set by nearly 300,000 tons, and once more demonstrated its ability to rise to the occasion at a time of crisis.

Progress of British Road Services

THE organisation of British Road Services was now broadly complete, and 1951 would be a year of consolidation, stated Lord Hurcomb, Chairman of the British Transport Commission, in a review of the progress of the Road Haulage Executive. Although various economies had been effected, operating expenses continued their upward trend; wage increases and higher prices for oil and tyres would mean an extra £3,500,000 on operating costs in 1951. Some 5,000 original permits would not be renewed when they terminated shortly. Of the remaining 7,000, the B.T.C. was willing to renew for another three years about 3,300 on a new basis, and had already reached agreement with 1,800 holders. Integration of road and rail services did not mean drastic redundancy, although staff changes would be necessary. Lord Hurcomb emphasised that some goods now carried by rail should go by road, and *vice versa*, but traders would still be able to state a preference, where alternative services existed. Last year, loaded miles rose by 20 per cent. In November, of 59,000,000 vehicle-miles run, only 10,000,000 was empty mileage, a total which compared well with good practice under private enterprise.

Welded Main-Line Track

A NOTABLE installation of welded rail has been completed recently by the Chicago & North Western Railway on its principal main line between Chicago and Milwaukee. This line carries a very heavy traffic including streamline trains running at speeds up to 90 m.p.h. The installation is in the centre track of this multi-track route for 10½ miles between Clybourn, just outside the Chicago city limits, and Wilmette, Illinois. Rail weighing 115 lb. per yd. was pre-welded at a rail-welding depot into 700-ft. lengths, and transported to the site on roller-equipped flat wagons, from which, assisted by mechanised tracklaying equipment, it was laid by track gangs at a rate which reached a maximum of 6,000 ft. of new rail a day. The 700-ft. rails were then welded up *in situ* into lengths governed only by the insulated rail gaps required for the signalling track circuits; the longest continuous rail so welded is 3,861 ft. The project has set a record for rail welding on the Chicago & North Western system and has cost \$285,000. It will be of interest to see to what extent

it makes possible economies in track maintenance, and also the behaviour of continuously welded rail under the dense traffic and high-speed conditions of this stretch of the C.N.W. system main line.

Viaduct Nearly Twelve Miles Long

MR. J. P. DUNNAGAN, Engineer for Bridges, Southern Pacific Railroad, U.S.A., writing in our contemporary *Railway Engineering & Maintenance*, gives some interesting facts concerning the twelve-mile Great Salt Lake timber trestle viaduct. Before 1903 the line ran from Ogden to Lucin, round the north coast of this salt-water inland sea, which covers an area of some 1,500 sq. miles. With the increasing importance of this, the Overland transcontinental route, it was then decided to build a chord line straight across the lake, thereby saving 44 miles. As, however, there are speed restrictions over the viaduct of 30 m.p.h. for streamline trains, and 20 m.p.h. for freight trains, the saving in time is probably proportionately less. Actually, the structure is 62,605 ft. or 11·86 miles long, and carries 8·80 miles of single line, 2·83 miles of double line, and 0·23 miles of triple track. Two men and two launches are permanently stationed at the viaduct to inspect it and guard against fire. The whole structure is inspected by launch and motor trolley alternately.

Features of the Viaduct and Lake

CONVENTIONAL longitudinal bracing is absent from this timber trestle viaduct because of the resistance it would offer to the waves caused by hurricanes that sweep this inland sea. None of the timber in its 4,186 pile bents or original ballast decking was treated, yet all the original piles are still in place and show no signs of decay, apart from a few damaged by ice and lightning. All steel fastenings are galvanised. When the decking was renewed in the 1920s, the new stringers were previously immersed in the lake for 90 days, to give them a salt preservative treatment. Large numbers of raking struts and piles and some under-deck stringer bracing struts have been added from time to time to strengthen the structure. The lake is curious in that its level gradually rises and falls through 10 or 12 ft. in cycles of 20 to 25 years. Also, though mainly very salt, it sometimes has a surface layer of fresh water which freezes and gives trouble.

Travelling Very Fast in Fog

IN this issue we publish a summary of the report by Brigadier C. A. Langley on the collision near Witham Junction on March 7, 1950, when a passenger mail train, travelling very fast in a fog, overtook a goods train moving slowly preparatory to entering a loop. Evidence was conflicting concerning the density of the fog, as might be expected under shifting conditions, and the signalmen had decided to call out their fogmen, really in preparation for dealing with some newspaper trains a little later, but did not consider conditions bad enough to justify the use of "double section" block working at the moment. Brigadier Langley considered whether one of the signalmen had accepted the fast train before replacing his distant and home signals to normal, but concluded that he had not committed so serious a breach of the rules, and that the driver had missed his location and overrun the signals, to which his earlier evidence to the railway officers gave support. The case has drawn attention to the necessity for clearly defining fog marking points at all signal boxes, laying down unambiguous instructions on the use of "fog block" and the benefits to be had from an extension of warning type A.T.C. to all distant signals.

A.T.C. in Switzerland

IN common with all important railway managements on the Continent the Swiss Federal Railways gave attention many years ago to the provision of cab signal indications with or without automatic brake action. Some attention was directed to this by the serious accident at Bellinzona in April, 1924, and the various systems in use or

proposed to be used on Continental and other lines were considered, and trials undertaken. In 1932 a head-on collision occurred in the Gütsch Tunnel, Lucerne, when it was decided at once to equip with inductive type apparatus all distant signals in rear of home signals. Ten years later another fatal collision occurred at Tüschierz caused by a driver falling asleep on an electric locomotive without the deadman equipment coming into action. The train ran through a station where it should have stopped, and entered irregularly on the occupied single line, where it met the one it should have crossed at that place. The extension of the automatic train control to the inner distant signals, that is, those signals provided in Switzerland to repeat the starting signals, and then all starting signals, also, was decided on. Elsewhere in this issue is an article by Dr. K. Oehler-Gutzwiller, who has been closely associated with the development of the apparatus used. This describes its working and the reasons for adopting the particular form of transmitting the induced impulses between the track and the train.

U.S.A. Passenger Stock Shortage

CONCERN is being expressed in United States railway circles at a possible shortage of passenger accommodation on the trains resulting from the present international situation and the troop movements that it renders necessary. Miracles were performed during the late war, just as in Great Britain, by pressing all available equipment into service, filling all seats, and using standing accommodation when absolutely necessary. But in mid-1940 there were 17,885 coaches and 6,443 sleeping cars available, to which there were added, during the war, 1,900 troop sleeping cars, 400 kitchen cars and 200 hospital cars. Since the war the troop sleepers have been sold and converted mostly into baggage vans, while there has been scrapping on an extensive scale of out-dated stock; the old convertible "standard" Pullmans, for example, which had berths wide enough to accommodate two men at a time on both upper and lower levels, have now given place largely to the modern single-room car of the "roomette" type. Today the U.S.A. railways have available a total of only 16,336 coaches and 5,930 sleeping cars, of less accommodation per car, because of their greater luxury, than the larger number of cars in 1940. In a recent issue the *Railway Age* raised this question in an urgent representation that larger orders for new passenger stock should be placed by the railways, in view of the almost certain large-scale increase of traffic. To give point to the argument, it was mentioned that the Greyhound motorcoach lines had recently placed a single order for 761 new diesel coaches, each seating 47 to 53 passengers, at a total cost of \$18 million.

New 2-8-2 Locomotives for India

THE "W.G." class 2-8-2 locomotives now under construction at the works of the North British Locomotive Co. Ltd. for the Indian Government Railways, and which are described and illustrated elsewhere in this issue, have many characteristics in common with the "W.P." class locomotives recently built in America, and are a further step in implementing the policy of standardisation embarked on by the Indian State Railways some years ago. Considerable interchangeability of components of these two classes of locomotives has been accomplished; this extends to boiler, motion, axleboxes, springs and hind truck and tender bogies. When standardisation began the number of standard locomotives allocated to the different railways was sometimes insufficient to justify a spare boiler. In consequence, difficulty was experienced in mechanical workshops during heavy repairs, as the mechanical repair was invariably completed in advance of the boiler; this was more apparent when locomotives were undergoing the second and subsequent heavy repair. The interchangeability between classes adopted by the Indian railways will be of considerable assistance to those responsible for the maintenance of locomotives. The equipment includes Nicholson thermic syphons and Ajax grease equipment.

Staff Economies on British Railways

IN an editorial article on the second annual report of the British Transport Commission in our September 22, 1950, issue, we remarked that staff and other economies on British Railways in 1949 had realised a saving of £6,500,000. As, in the words of the report, staff costs are the most important single component of B.T.C. expenditure, and for British Railways represent some 60 per cent. (the actual figure is not given) of the total expenses of £312,827,636, it is clear that economies which can be realised under this head are desirable. "Staff Costs" include salaries and wages, insurance, clothing, and pensions. The saving in salaries and wages for other than maintenance staff was £4,900,000.

The 1948 report of the Commission stated that in the main staff groups the weekly earnings, despite a shorter working week, had roughly doubled since before the war. The total of British Railways staff (including cartage) was reduced during 1949 to 624,528, a decline of 23,151, plus 1,061 transferred to other Executives. By August 13, 1950, a further reduction to 618,421 had been effected. This fall has been brought about partly by getting rid of the surplus staff which was the aftermath of war, and the decline is not likely to continue at the same rate. The total staff in the administrative, clerical and technical grades of the Railway Executive fell by some 1,500 during the year.

To assist in keeping a watch on the numbers of staff employed, the Regions send in four-weekly returns containing the undermentioned information:—

- (a) Number of staff on payroll at beginning of period;
- (b) Recruitment during period, including transfers from other Regions and Executives;
- (c) Wastages, due to deaths, retirements, resignations and dismissals;
- (d) Transfer to other Regions and Executives;
- (e) Number of staff on payroll at end of period.

Early in 1948 the Chief Regional Officers were requested to satisfy themselves that the best use was being made of the staff then employed so as to curtail requirements for additional staff and avoid replacement of staff who had retired or resigned. Investigating Committees, each consisting of a small number of staff experienced in general railway working and organising of staff duties, were set up to examine the situation at depots and stations and suggest means of making the best use of available staff and reducing the number of posts to those essential for efficiency. The desirability of advising the staff through the medium of the consultative machinery of economy measures contemplated was emphasised.

It was decided in November, 1948, to aim at an overall reduction of 26,000 staff by the end of March, 1949. This figure was based on the difference between the number of staff in July, 1948, and the number in March, 1938, increased by 12½ per cent. to cover the shorter working week, extended holidays, and increases in work.

The Railway Executive Member for Staff & Establishment discussed with each of the Chief Regional Officers the means of effecting the desired reductions, and it was decided to give special consideration to the following points:—

- (a) Restriction of recruitment;
- (b) Extent to which outstanding vacancies could be reduced;
- (c) Use of normal wastage to absorb redundant staff;
- (d) Dispensing with women staff to provide for redundant male staff;
- (e) Retirement of wages staff over 65 years of age;
- (f) Retirement of salaried staff;
- (g) Transfer of redundant staff to other Executives.

Recruitment was to be slowed, so that in the main, the normal wastage (retirement, resignation, dismissal, or death) could reduce the numbers. The next step, it was stated, would be to dispense with temporary staff and women filling men's posts, and retire early suitable-aged staff. Dismissals of regular staff would be resorted to only if the other measures did not bring about the desired reduction. This intention has largely succeeded.

As a result of the elimination of old company boundaries, staff economy may be achieved, sometimes indirectly, by such measures as re-routing traffic over more direct or more convenient routes, avoiding changing engines and crews at former "frontiers" and more careful arrangement and re-allocation of duties, enabling overtime working to be abolished or cut. The reorganisation of London ticket offices has been approved, and it is expected that co-ordination of some of them will achieve an economy in staff. The overlapping commercial representation of the former companies has been unified, enabling the number of railway representatives to be reduced from 1,042 to 722.

Closing of branches and little-used stations, further mechanisation, and the concentration of traffic at fewer stations and depots can all help to realise savings in staff. A special committee of the Railway Executive constantly reviews branch lines, and it is only after careful assessment of all aspects and an examination of the prospects of reviving traffic that the decision to continue operation of or close a station or line, is made. Most lightly-trafficked lines are, in any case, worked with the minimum of staff, locomotives and rolling stock, and the savings expected from closing should not therefore be pitched too high. For example, the estimated economies under all headings from the branches authorised for complete or partial closing in the first half of 1950 were not more than £150,000.

Fluctuations of staff during the year are due to seasonal recruitment of operating and catering staff for handling summer traffic and holiday relief. At the present time of acute housing shortage it is far more difficult than before the war to move staff about to the best advantage without causing hardship. Negotiations between the railways and local authorities in an attempt to secure a larger allocation of council houses for railwaymen have not met with much success.

Developments in Sierra Leone

SOME interesting facts and figures relating to the Sierra Leone Railway appear in a booklet* which Mr. W. Venner, the General Manager, has issued. For example in the 136 miles between Freetown, the capital, and Bo, the principal town in the Protectorate, there are 27,000 deg. of curvature and 3,000 ft. of rise and fall, though Bo is only 243 ft. higher than Freetown. Other features mentioned were described in our February 25, 1949, issue, but proposals for the future are new.

As reconstruction of the existing 2 ft. 6 in. gauge to 3 ft. 6 in. cannot be justified financially, it is proposed to rebuild the first 64 miles to Bauya. This involves extensive realignment and regrading, reconstruction of most of the bridges, and relaying with heavier track, to enable heavier engines to haul 100 per cent. heavier loads at higher speeds. The worst gradients between Bauya and Bo are to be eliminated. Rates and fares are to be revised to secure increased revenue; the principle of the Marketing Board paying for the freight on exports has been accepted and acted on in 1950.

Extension of the carriage and wagon workshops has enabled work to begin on the construction of new coaches. Underframes, bogies, wheels, and electrical equipment still have to be imported from the United Kingdom, but assembly is now done in the colony. Rebuilding of locomotives to haul heavier loads will soon be possible when the repair shops extension is completed.

An experimental fast passenger service throughout the full 227-mile length of the main line to Pendembu has been introduced, enabling the journey to be completed in one day for the first time. The introduction of night running of goods trains now makes it possible for wagons loaded at stations from Pendembu to Bo on one morning to be ready for delivery at Freetown on the next. Local lignite as a locomotive fuel in briquette form is being tried; though its calorific value is low, its use will involve no expenditure outside the colony.

* "Something about the Sierra Leone Railway." Issued by W. Venner, General Manager, Sierra Leone Railway. Printed by the Government Printer, Freetown. 9½ in. x 6 in. 13 pp. Paper cover.

British Transport Commission Traffic Receipts

THE advance figures for the last four-weekly period of 1950 show that British Railways traffic receipts for the year, exclusive of cartage, exceeded by some £3,000,000 the estimate (but adjusted in the light of last May's freight rate increases) which was given a year ago by Mr. R. H. Wilson, Comptroller of the British Transport Commission, to the Transport Tribunal committee considering the B.T.C. application for the rate increase. Apart from the freight rate increase, the total increase in British Railways receipts, of 4.4 per cent. over 1949, was caused mainly by the rise in railway merchandise receipts, which was 8.5 per cent. for the year, and 18.3 per cent. for Period 13; this presumably was due to increased national production. Coal and coke receipts, which during the preceding period were over 20 per cent. above last year's figure, were only 16.6 per cent. over 1949 during Period 13, reflecting decreased coal production as compared with last year; the decrease of 12 per cent. compared with Period 12 cannot altogether be explained by the Christmas holiday.

Passenger receipts during Period 13 were 1.7 per cent. down on last year; this points to some revival of rail travel for the Christmas holiday, as receipts for Period 12 were 5.5 per cent. down on 1949. For the year, however, passenger receipts show a decrease of 6.3 per cent.

	Four weeks to December 31		Incr. or decr.	Aggregate for 52 weeks		Incr. or decr.
	1950	1949		1950	1949	
	£000	£000		£000	£000	
British Railways—						
Passengers	7,969	8,108	139	106,510	113,713	- 7,203
Parcels, etc., by passen- ger train	2,364	2,150	214	30,847	28,953	1,894
Merchandise & livestock ...	6,749	5,704	1,045	87,981	81,025	6,956
Minerals	2,520	2,245	275	32,534	29,629	2,905
Coal & coke	5,966	5,115	851	77,683	67,856	9,827
	25,568	23,322	2,246	335,555	321,176	14,379
Road Passenger Transport:						
Provincial & Scottish Buses, coaches & trolley- buses	2,579	2,321	258	37,971	35,101	2,870
London Transport						
Railways	1,210	1,113	97	14,635	14,379	256
Buses & coaches	2,234	2,270	36	30,744	31,251	507
Trolleybuses & trams	760	809	49	10,514	10,906	392
	4,204	4,192	12	55,893	56,536	643
Inland Waterways						
Tolls	56	51	5	784	686	98
Freight charges, etc.	57	60	3	838	834	4
	113	111	2	1,622	1,520	102
Total	32,464	29,946	2,518	431,041	414,333	16,708

London Transport railway receipts for Period 13 were 8.7 per cent. above last year's, and 1.7 per cent. for the whole year, receipts for the last quarter of the year having been affected by the London Charges Scheme. The drop in London Transport bus and coach receipts for Period 13 over last year (1.5 per cent.) is in contrast to the slight increase over last year shown in the preceding period, and is presumably due to reduced travel at Christmas.

PERCENTAGE VARIATION 1950 COMPARED WITH 1949

	4 weeks to December 31		52 weeks to December 31	
	1950	1949	1950	1949
British Railways—				
Passengers	- 1.7	- 8.3		
Parcels	- 9.9	- 6.5		
Merchandise & livestock ...	- 18.3	- 8.5		
Minerals	- 12.2	- 9.8		
Coal & coke	- 16.6	- 14.4		
Total	- 9.6	- 4.4		
Road Passenger Transport				
... ..	- 11.1	- 8.1		
London Transport—				
Railways	- 8.7	- 1.7		
Buses & coaches	- 1.5	- 1.6		
Trolleybuses & trams	- 6.0	- 3.5		
Total	- 0.3	- 1.1		
Inland Waterways	- 1.8	6.7		
Aggregate	- 8.4	4.0		

London Railway Plan—A New Approach Needed

(From a Correspondent)

POSTPONEMENT of the projected extension of the Bakerloo tube to Camberwell Green in consequence of the very heavy cost of the work at present prices is a plain indication that all the elaborate programme of new tubes in the London area set out in the County of London Plan, 1943, and subsequently revised by the Railway (London Plan) Committee and the Working Party of the Committee appointed by the British Transport Commission must be pigeonholed. Obviously, there is no hope of earning sufficient revenue to pay the interest charges, depreciation, and operating costs of tube railways costing nearly £31 m. a mile to construct. What the cost of the larger tubes designed to carry main-line rolling stock contemplated by the revised London Plan would be, on the basis of the tenders received for the Elephant-Camberwell Green section, it would be foolish to estimate, but it would certainly be so great that they must be regarded as white elephants of an even larger species than extensions or additions to the existing type of tube. It would seem that if anything is to be done in the immediate future to improve the present railway facilities of the Metropolis an entirely new approach to the problem is needed.

Since the completion of the Central Line extensions eastwards to Epping and westwards to West Ruislip and the electrification of the Liverpool Street to Shenfield line (with the unused section from Stratford to Fenchurch Street) all new work in the London region seems to have come to a full stop. There remains a number of partly begun or not yet started portions of the pre-war London Transport programme which could be completed without excessive capital expenditure, but these seem to be involved in a long drawn-out battle of priorities from which occasional scraps of information emerge without much practical effect. Recently it was announced that because of uncertainty as to the precise boundaries of the "green belt" in the north west, the projected surface extension of the Northern tube from Edgware to Bushey Heath was off, but that when the position of the "green belt" was better defined, and it became possible to assess the prospects of building development in this locality, the line might be completed as far as Brockley Hill—one station beyond Edgware.

The electrification and doubling of the old single track branch, which is at present operated by London Transport only as far as Mill Hill East, might then be extended to Mill Hill (The Hale) or to Edgware, according to the original programme. It has also been reported that electrification of the Southend line has been given top priority and that preliminary steps have been taken to prepare the necessary plans. Here, again, even if the cost of the work does not frighten both the British Transport Commission and the Government, there seems to be the likelihood of a first-class wrangle over the systems to be adopted. The matter is already complicated by the fact that the Underground pair of tracks from Bromley to Upminster is operated on the four-rail system while the overhead 1,500-volt system has been installed (although no electric trains are worked over it) between Gas Factory Junction and Stepney East, where the two tracks are now used only by the Southend and Tilbury trains, and on two of the four tracks (also now used exclusively by these trains) from Stepney East into Fenchurch Street. The London Plan scheme for taking the Southend line trains through central London in a tube (if not so dead that it need not be taken into consideration) also complicates the picture.

There is no question as to the desirability and, indeed, the urgency of these works, and this is also true of other parts of the authorised London Transport programme. This includes the electrification of the Alexandra Palace line and the connection between the Northern City tube and the surface tracks at Finsbury Park, the widening of the Metropolitan tracks between Harrow-on-the-Hill and Rickmansworth (much of the earthworks and bridging was done before the war put a stop to the work, and the extension of electrification to Amersham and Chesham. Now

that the construction of deep tubes is known to be too costly to be practicable while prices remain at anything like their present level, why not get on with these unfinished jobs and let the travelling public have the benefit of the money that has already been spent on them?

It does not require much searching to discover other surface improvements that could be effected at reasonable cost and would be well worth while. The "widened lines" between Kings Cross and Moorgate could be turned to better account than they are at present if the tunnel under Kings Cross main-line station were electrified as well as the suburban tracks to Hitchin and Hertford. A clean electric service could then be given from all parts of the old Great Northern suburban area to the City. A further improvement, also using the Moorgate-Kings Cross widened lines, would be provided by electrifying the suburban services of the old Midland system to St. Albans and Tottenham. Electrification of the short link from Canonbury to Finsbury Park would give electric trains from the old Great Northern system access to Broad Street, of which insufficient use has been made since the service to Poplar was discontinued. Still further east there is scope for electrification of several suburban services to the north-east and north out of Liverpool Street. Apart from the additional facilities for travel that would be provided, this group of betterments would be valuable from the point of view of smoke abatement since it would reduce the number of steam locomotives entering a part of the central area which is particularly subject to dirty fogs in winter.

South of the Thames, where the electrification of suburban lines has long since been completed, only minor improvements can be made without embarking on the extensive programme of new tubes, some of them associated with the scheme for getting rid of the Charing Cross railway bridge, which we must now resign ourselves to having with us for a long time to come. It might, however, be worth considering two relatively small proposals for giving residents in the south-eastern and south-western suburbs alternative routes to the City and to the western and northern districts of the central area. By providing a connection between the Underground tracks at New Cross and New Cross Gate and those of the Southern Region it would be possible to project the Metropolitan trains which now terminate at these stations over the Southern lines to convenient terminal points in the south-eastern area, giving a through route to stations on the Inner Circle from Liverpool Street to Edgware Road and on to Hammersmith. In the west, electrification of the line from Clapham Junction to Olympia (Addison Road) would enable Southern (or Metropolitan) trains to be run between Edgware Road and stations on the Southern suburban system beyond Clapham Junction. This would improve the means of access to both the Earls Court and Olympia exhibition and entertainment halls, besides providing a through service from the south-western suburbs to Paddington and Edgware Road.

As the cost factor stands in the way of further tube construction, we may as well accept the fact that new through routes across central London are out of the question indefinitely and turn our attention to what is within the range of practicability. A resolute and sustained effort to banish the steam locomotive from the metropolitan area by electrifying all the main lines to convenient points for changing over from electric to steam locomotives would enable services to be improved, cleaner trains to be provided, and do a good deal to reduce atmospheric pollution in London. A target date might well be set for completion of such a programme, based on the conversion of as many miles each year as our resources of capital and labour will permit.

BRITISH INDUSTRIES FAIR: 1951.—Letters of allocation have now gone out to the firms which have applied for space at the thirtieth British Industries Fair to be held in London and Birmingham from April 30 to May 11. For the Birmingham section, Castle Bromwich, final figures will not be ready for some time, though it is probable that the outdoor section will again be extended. Information about exhibits, photographs and so on, supplied by intending exhibitors can be obtained from the Press Offices, B.I.F., Lacon House, London, W.C.1.

LETTERS TO THE EDITOR

(The Editor is not responsible for the opinions of correspondents)

Railway Charges, Efficiency, and Integration

January 8

SIR,—Mr. Frederick Smith's letter in your issue of January 5 quotes an extract from what Sir William Wood said on war-time traffics. Sir William Wood related this to the simple question of the incidence of fixed charges including interest on capital, illustrating the point that with increased traffics, fixed costs were spread more easily and the extract had no relation to his comments on efficiency.

Mr. Smith's criticism of 1944 as the "worst year in railway history in regard to inferiority of services" is unjust, although, I am sure, unintentionally so. The national wartime demands were great and were met in full by the railway staff despite bombing and other interference. Mr. Robert Bell describes adequately these difficulties and how they were overcome in his "History of the British Railways during the War, 1939-45".

Yours faithfully,

J. S. BOUMPHREY

27, Goodwyn Avenue, N.W.7

Southern Region Ten-Car Trains

December 20

SIR,—I note that ten-car trains are to be formed instead of more double-deck trains on the Southern Region, and would much like to know if the extra coaches will all be of post-war construction identical with the current output in coachwork and whether they will be saloon trailers, motor trailers or independent units. If independent units, will both or one be a motor unit? Will they be absorbed into the present units to create five-car sets or be run four-two-four? The second arrangement would be retrograde in view of the time it took the Southern Railway to remove the shunting nuisance resulting from the use of the trailers.

Further, it is agreed that platforms must be lengthened. As traffic will be certain still to increase, why not now lengthen them enough for twelve-car rakes, thereby obviating the two-car unit and enabling the existing four-car sets to be used unaltered in four-eight, or twelve-car sets, corresponding to local traffic demands?

Yours faithfully,

M. E. MAWSON

23, Bingham Road, Croydon

Eight-Car Trains on the District Line

December 19

SIR,—I should like to reply to your correspondent Mr. J. E. L. Skelton in your December 15, 1950, issue, regarding the working of eight-car trains on the District Line.

The observation made by you, that between 5.30 p.m. and 6 p.m. the number of eight-car sets is higher, is correct. In fact out of sixteen District trains the distribution is: 10 of eight cars; 5 of six; and 1 of seven cars. Seven of the "eights" are from 5.41 to 5.53 p.m.;—

Time	Destination	Cars
5.41	Richmond	8
5.42½	Hounslow	8
5.45½	Ealing	8
5.47	Wimbledon	8
5.48½	Richmond	8
5.50	Hounslow	8
5.53	Ealing	8

These are as per Working Time Table, in operation since June 5, 1950, and, if the service runs normally, those sets run as stated. When Mr. Skelton made his observation on September 27 the service was running five minutes behind schedule, two sets running out of order. It is true that after 6.10 the peak is over, not so noticeably perhaps at Charing Cross, but certainly along the line.

The second point is the reduction of trains during the

off-peak. This is being done on the Bakerloo Line, where four-car sets are running. Working that way entails uncoupling and re-coupling, which in turn requires more staff, and we know that there is a staff shortage, unfortunately, on the L.T.E. railways, as on others. Your correspondent must also realise that in running such a fast service as on the L.T.E. lines the slightest mishap can affect the service—not always noticeable by the public, but most noticeable in the signal cabins, and stationmasters' offices.

As the new "R" stock comes into service more, the public will benefit, but as they are new, and are not so easy to repair whilst on the road as the older "sevens" and "sixes" (F. H. G. & Q. stock) they are taken out of service and, to maintain an efficient service a seven-car or six-car set is reformed to fill the gap.

On some points of the line, in bay roads and sidings, an eight-car train cannot be stabled; it therefore has to be a six- or seven-car train that performs a trip ending in one of those shorter stabling roads.

Yours faithfully,

K. A. LAMBERT

3, Highgate Road, N.W.5

[We would state that there is no justification for suggesting that the new "R" stock is more likely to be withdrawn from service for repair purposes than earlier types. It is incorrect to suggest that the service is adversely affected by the introduction of new cars.—ED., R.G.]

Second Class in Britain

January 5

SIR,—I noticed in your issue of December 29 last that the Great Northern Railway (Ireland) was to abolish second class accommodation in all its trains as from January 1, and that you mentioned that it is still possible to travel second class on the railways of the Ulster Transport Authority.

Is there not one other railway in the British Isles on which one can still travel second class (other than by certain Continental boat trains of the Railway Executive), albeit by only one train and in only one direction? I refer to the Sligo, Leitrim & Northern Counties Railway and its 7.20 p.m. train from Enniskillen to Sligo. If I am right, may the day be far distant when the S.L.N.C.R. robs the 7.20 p.m. of its distinction!

Yours faithfully,

PATRICK HART

11, Westbury Road, Beckenham

Southern Region Pacifics

January 6

SIR,—Though not qualified engineers, we, in three years' service doing the majority of the repairs on the S.R. Pacifics, have taken every opportunity to study their design and maintenance.

There is no doubt that those on the Eastern Section arrive at works in generally much worse condition than those from Salisbury and Exmouth Junction sheds. It is a need not for more attention so much as for the right kind; Salisbury and Exmouth Junction are obviously more conscious of this fact. It is suggested that corrosion and wear are caused by steam leaking into the oil bath and then condensing. If so, why should this not happen in the west as well as in the east?

We agree that the fault with the valve gear lies with the rocker shaft. Proof of this lies in the great number of these parts, usually with parts working immediately adjacent to them, sent to works for repair from motive power depots. This is obviously a fault in the design, but does not affect the argument regarding total enclosure of valve gear. Many of the running repairs to these engines are

connected with the rocking shaft, and the bad valve timing is caused almost entirely by wear thereabouts, and not by other factors. If this final drive to the valve could be satisfactorily modified, maintenance costs would drop well below the usual level, and fuel consumption would at least be moderate.

As to the "Leader" class, this is a good idea carried to its logical conclusion—partial enclosure of valve gear to total enclosure of moving parts. The "Leader" has been running trials with the outer oil bath covers removed, exposing the ends of the sleeve valves and valve operating rods to dirt and grit, which has doubtless caused unnecessary wear on the valves, through no fault in the original design.

And why this cry for accessibility, when road vehicles, working in far less dirty conditions, have had totally enclosed moving parts for years? A well-fitted locomotive mechanism, totally enclosed and mechanically lubricated, should run for months with nothing but routine inspection until it eventually goes to works—not running shed—for overhaul in good workshop conditions.

Yours faithfully,

J. BUCHANAN
A. J. LEOPARD

60, Brownhill Road, Chandler's Ford

British Railways Standard Coaches

December 18

SIR,—One cannot help feeling that Mr. Dewhurst in his letter in your December 8 issue is attempting to halt progress towards more comfortable coaching stock, for the flimsiest of reasons.

As a constant traveller on the London Midland Region I can testify to the greatly improved comfort of the three-a-side seating when the armrests are down, and have never experienced the slightest discomfort when sitting four-a-side, the armrests retracting cleanly into the seat back. I also feel that Mr. Dewhurst is exaggerating when he states that it is a "brave passenger who enters a compartment where six people are already seated with the armrests down." If he travelled with me, he would see this done regularly, as the rule rather than the exception.

His remarks with regard to passengers with reserved seats sitting tight and refusing to "up arms," do not arise where the practice of reserving the four corner seats only is followed, leaving the centre seats as the unreserved portion of the accommodation.

I agree with Mr. Dewhurst that some confusion and unpleasantness is caused by the division of the compartment seating space into three, by the retractable armrests, and I suggest that this can be avoided by numbering the seats, four-a-side, or by the display of a "To Seat 4" notice, on each side of the compartment, as was the practice of one of the former main line railway companies.

Yours faithfully,

ROGER W. HALL

68a, High Street, Northwood

Thinking of Transport as a Whole

December 1

SIR,—Dr. Gilbert Walker is one of the few professional economists whose views on the transport problem are worth anything in a practical sense. In general, it is the professional economists who, over the years, have been paired with the accountants in the primary responsibility for the present sorry state of affairs. Both groups have been detached from reality, since they have dealt with money values, and, consequently, have sought and continue to seek a solution through monopolistic price control of a problem which is financial only because of failure to deal with the physical problem.

Far too much has been made of the track question when sympathising with the railway people. They have had a raw deal, but it has not been because of track costs, for we must logically take into account the burden of taxation

and duties which road transport has to bear. A levelling process would put the railways in a more inferior position than today.

The suggestions of the F.B.I. are merely rhetorical escapism, for the equipment retained for strategic purposes, even if it could be isolated and were serviced by the State, would not make any difference to rates and charges. There is something to be said for transferring the burden of capital charges, which must be distinguished from real costs, related to general community and social interests, which require maintenance of unremunerative equipment and services, to the community at large. This would, I think, mean the transfer also of similar responsibilities on the road side, and the last state of the railways would be worse than the first.

We ought to treat our system of communications as a whole, and embody all track and fixed equipment in a comprehensive communications fund, serviced in a financial sense largely by the State, and partly by a levy of so much a ton on the traffic handled. Private cars and traders' own vehicles might carry a differential above the railways, canals, inland waterways, and professional road hauliers, to cover the facilities maintained for the public service, including users in these classes, for the privilege of being allowed to contract out.

Such an idea is only palliative and does little to remove the general burden of costs from the backs of the community. The policy of bringing other transport costs up to railway level merely aggravates the general problem of internal prices. The crux of the transport problem is that the railways continue to be used for traffic more suitable to more flexible forms of transport, namely, the slow-moving feeder traffic which, directly and indirectly, produces a pitifully low average of train load, wagon load, and distance moved in time.

Our thinking is still in terms of road and rail transport in conflict (even within the B.T.C.). We must learn to think of a system of communications comprising fixed and limited tracks, railways and inland waterways for example, supplementing a ubiquitous road system. These things should come before changing the price-structure of transport even if we subsidise the railways heavily for a year or two.

Yours faithfully,

FREDERICK SMITH

65, Hallowell Road, Northwood

French High-Speed Running

January 11

SIR,—Baron Vuillet in his letter of October 6 (published in your issue of January 5) on the high level of speed scheduled on the S.N.C.F. mentions that the five daily services in both directions between Paris and Nice have an average speed of 49.5 m.p.h. over the 676 miles, and adds, "No comment is necessary." I hope that the following will not be considered unnecessary comment.

The five daily services include three which are restricted to first and second class passengers ("Train Bleu," "Paris-Côte d'Azur" and "Le Mistral"). Only two services, one night and one day, convey third class passengers and these trains, which probably carry the bulk of the traffic, average 45.0 m.p.h.

The 483 miles between Dijon and Nice are operated by steam traction and a similar service in Great Britain, comparable as regards distance, is London and Montrose by the East Coast route. If one day and one night service in each direction is selected from the current winter timetables by which third class passengers may travel in both countries, I think that it will be found that the average time is 11 hr. 1 min. for the 483 miles between Kings Cross and Montrose and the same between Dijon and Nice with an average speed of 43.9 m.p.h. The fastest of these journeys is 10 hr. 46 min. in this country and 10 hr. 43 min. in France, and the slowest of the four trips is 11 hr. 18 min. in both countries.

Yours faithfully,

C. H. LOTT

14a, Carlisle Mansions, S.W.1

THE SCRAP HEAP

London Midland Region Boxers

Ninety-nine railwaymen from all parts of the Region have entered for the London Midland Region boxing championships to be held at Horwich today (Friday) and at Crewe on January 27. One of the biggest draws at Crewe today will be Parcel Porter Denis Maher, one of six entries from Dublin, who scales 20 stone 8 lb. Winners of the contest in ten recognised weights will be L.M.R. champions for 1951.

"Bowler-Hatted"

Colonel Harold Rudgard, who recently retired from the position of Chief Officer (Motive Power) to the Railway Executive, was the recipient recently of a farewell present from his colleagues on the operating, mechanical & electrical, and carriage & wagon engineers committees. After the formal presentation and speeches, however, a considerably less formal ceremony took place.

Service with the Forces rendered by Colonel Rudgard during the 1914-18 war had been recalled, and his friends decided that he should once again be "bowler-hatted" in a more practical manner than the term usually implies. To keep fresh this symbol of civilian life, and especially of railway service, and also to maintain an association with his work, Mr. R. A. Riddles, Member of the Railway Executive for Mechanical & Electrical Engineering, invited Colonel Rudgard to lift the lid of a box, and the photograph reproduced below shows the somewhat unusual "bowler" then revealed.

The wheels are made of syrup tin

lids, and the motion works. On opening the firebox door, a notice demands that it be shut again, to keep out the draught. Mr. George Hussey, a member of Mr. Riddles' staff, was the locomotive manufacturer.

A Mere Fleabite

A young man accidentally dropped a small glass box containing trained fleas on the train between Turin and Venice. The fleas no longer responded to his blandishments once they were free, and the crowded carriage became very agitated. The passengers scattered, causing further agitation in other carriages. When the train reached Milan there was a rush for D.D.T. powder, and the young man was denounced to the station police, but they could not find him. — *From "The Manchester Guardian."*

Seats for All

The nearest possible approach to guaranteeing a seat for all was effected by the North Eastern Region of British Railways when it ran 15 special trains to the Middlesbrough-Leeds United cup final on January 6. Because 12,000 passengers were expected from Middlesbrough alone, a system of advance booking was adopted, each ticket bearing a special letter which referred to a particular train, and the holder was allowed to join only that train and return from Leeds City by the train shown on the ticket. An advantage of the system was that supporters booking in advance could choose the train whose time and departure most readily suited them.

Continuous Performances

They were complaining about—

Traffic blocks,
Dirty railway carriages,
Housing shortages,
Taxation,
War threats,

The tuberculosis problem—
in the newspapers of January, 1901.—
From "An Editorial Diary" in "The Glasgow Herald."

Welsh Rarebit

(See "Scrap Heap," October 20 & 27, and December 8, 1950)

Said Waterloo (London) to Waterloo (Glam.):

"I suppose that you know what a big swell I am;

As for you, well. I'd never have heard of you yet,

If I hadn't been reading *The Railway Gazette*.

"I've twenty-one platforms and offices grand

And bridges that stretch right away to the Strand,

And millions of people admire me each year—

That's more than you'll see in a lifetime, I fear.

"From what I have heard about you I opine

You must be some quaint country cousin of mine;

Pack yourself on some wagon that's coming this way

And pop up to London to see me some day."

Said Waterloo (Glam.): "Look you, all that may be,

But I'm pretty important to Caerphilly. And—goodness!—what would they do

down Machen way,

If it weren't for my six 'one-way' trains every day?

"I've heard about London and all its fine tales,

But I love the green valleys and mountains of Wales,

And I'm sure you've no friends among all that great host

To compare with Dai Morgan and Evans the Post.

"We're not very fussy and not very grand

And we don't care a bit for your silly old Strand;

And, as for your platforms, you keep 'em—for me,

I can manage with sleepers and ballast, you see.

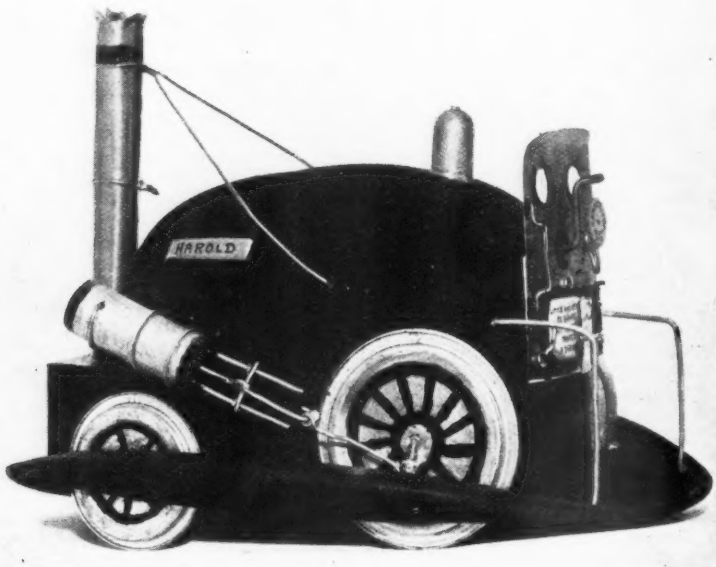
"For, down here in Cymru, the land of the leek,

We don't work our hearts out for seven days a week,

But one thing we're keen on (exceedingly sharp!)

If the Scots have their st... give us back the Welsh Harp!"

A. B.



Colonel Harold Rudgard was recently "bowler-hatted" by his former colleagues at an informal ceremony on the occasion of his retirement from the Railway Executive (see paragraph above)

OVERSEAS RAILWAY AFFAIRS

(From our correspondents)

NEW SOUTH WALES

Eastern Suburbs Railway

The Government has appointed a technical committee to report on the most suitable route to be followed by the Sydney Eastern Suburbs railway extension. It consists of Professor W. A. Miller, Department of Civil Engineering, University of Sydney; Professor Denis Winston, Department of Town & Country Planning of that university; and Mr. C. H. Munro, Lecturer at the University of Technology, Sydney.

WESTERN AUSTRALIA

Wagon Turnround Campaign

A three-month intensive "Wagon Turnround" publicity campaign has been concluded, with satisfactory results. The expansion of goods business since the war, the deteriorated condition of the wagons following intensive usage and deferment of full maintenance during the war, and the effect of the 40-hr. week, with the cessation of industrial activities on Saturdays, have combined to reduce the availability of wagons for general business.

The services of a firm of advertising consultants were enlisted, and in conjunction with the Department's own publicity section, the publicity was put out by the press, radio, theatre slides, posters, folder and envelope sticker. Regular use was also made of the *Railway Magazine*, the weekly notice, and circular letters to draw the attention of the staff to the necessity for quick release of wagons. A city window display, with moving equipment, was opened.

The larger stock and produce firms assisted by distributing posters and folders to their agents. Newspaper advertising was on an extensive scale. It is difficult to gauge the effect which publicity of this kind has had, but reports indicated that the general reaction was favourable and that it was evident the public and staff were now fully aware of the necessity for prompt despatch of wagons.

ARGENTINA

Labour Unrest

In spite of the settlement in November last of the dispute between the railways and their guards, signalmen, level-crossing keepers, and cleaners, as reported in our December 15, 1950, issue, a certain section of these grades proclaimed its dissatisfaction with the terms of settlement and called a further strike in December with the object of obtaining a minimum wage of 550 pesos, the resignation of the committee of the Union Ferroviaria and withdrawal of all disciplinary measures. An emergency strike committee was formed and, de-

spite the efforts of the Union Ferroviaria, the new stoppage was almost complete in the Buenos Aires district for three days.

The Ministry of Transport ordered the strikers back under pain of dismissal, and although this order was not heeded immediately, the strikers returned when it was learned that these demands were being considered by the highest authorities. The committee members of the Union Ferroviaria handed in their resignations to facilitate an agreement, but the General Workers' Federation intervened the union. On December 20 the "interventores" held a meeting with the Minister of Labour & Welfare, the under-secretaries of the Ministry of Transport, and the general secretary of the Federation, at which it was decided to authorise a new wage scale with a minimum salary of 400 pesos and a maximum of 575 per month after ten years.

All railway employees and workmen will henceforth receive an additional increase of 125 pesos per month, irrespective of grades or posts. Apart from this, all men earning less than 800 pesos will receive a family allowance of 25 pesos for their wives and for each child under 15 years of age. This resolution was accepted by the men and all services were at once resumed under normal conditions.

Roca Branch Transferred

The lines of the General Roca Railway between Toay, Darregueira and Bahía Blanca, formerly part of the Bahía Blanca & North-Western Railway, have now been transferred to the Sarmiento Railway, which now gains access to the port of Bahía Blanca over its own metals. The branch from Villa Iris to López Lecube is included in the transfer.

Patron Saint Enthroned

A statue of the Virgin of Lujan, Patron Saint of the railways, has been enthroned in the Grand Hall of Presidente Peron Station, General Mitre Railway, in the space formerly occupied by the Central Argentine Railway War Memorial. The ceremony was presided over by His Eminence Cardinal Copello, and was attended by the Minister of Transport and high officials of the Ministry and the railway.

Unusual Accident

A strange accident recently took place on the General San Martín Railway when a cut of wagons broke loose from shunting operations at Lunlunta Station and started to run down a steep incline. The driver of a light engine on the same track saw them coming and reversed his engine, but was unable to avoid a collision in which the wagons were derailed. Both he and the fireman jumped to safety, but the engine continued on its own, gathering speed as it

went, and passing through station after station. The track was cleared ahead of it and it passed through Mendoza Station at 50 m.p.h. As the driver had managed to open the escape valve before jumping, the runaway finally came to a stand some miles up the line to San Juan. No further damage was done.

SWITZERLAND

Rolling Stock Orders

The increasing shortage of raw materials, as well as the rising prices for sheet steel, prompted the Federal Railways to place in December their principal orders for passenger rolling stock intended for 1951. Credits allocated for this covered fifteen composite first-class and second-class, ten second-class coaches, forty third-class, and six remote-control coaches for push-pull trains; all are to be built of light-weight steel. The orders have been entrusted to four firms.

Increasing Power Consumption

The consumption of power on the Federal Railways for traction purposes reached 3,500,000 kWh on December 23 last, the highest per day yet attained. The previous maximum per day amounted to 3,000,000 kWh. This exceptional increase is said to have been due to the great increase of passenger traffic just before Christmas, when, due mainly to the numbers of foreign tourists, many extra trains had to be run.

Apart from this more power for traction purposes has been consumed for some months, because of the increase of goods traffic resulting from defence preparations which has necessitated the introduction of additional goods trains.

FRANCE

Electric Traction Economies

An estimate of the economy effected by electric traction on the Laroche-Dijon section in June is published in *Notre Métier*. For 504,621 train-km. the traction costs were fr.42,326,383. This figure includes upkeep of substations, and, adding the upkeep of overhead equipment, fr.4,900,000, the total traction cost becomes fr.47,290,000. Hence the cost per train-km. is fr.93.5

In 1949, the cost of steam traction on the Laroche to Dijon line was fr.1,519,310,000 for 5,825,272 train-km., which brings the train-km. to fr.260.8. To compare with electric traction costs, allowance must be made for increased costs of materials and personnel between 1949 and June, 1950. This brings the train-km. cost of steam traction to fr.274.6. The economy per train-km. then becomes fr.181.1; hence the economy effected in June is fr.91,400,000.

A further estimate of the saving by electric traction from January 6, 1950, when freight trains on the line began to be electrically hauled, until the end of 1950, works out to a total of fr.1,231,300,000.

Notre Métier concludes that this economy of more than fr.1,200,000,000 justifies the expenditure involved in electrification.

ALBANIA

Extension of Durazzo-Pekinj Line

A standard-gauge line from Pekinj to Elbasan 22 miles, an extension of the Durazzo-Pekinj line, is reported as opened to traffic on December 22. Some 22,000 unpaid youth labour appear to have been employed on the extension. Elbasan is 30 miles west of the Yugoslav frontier, near the western shore of Lake Ohrid, and when, in 1947, the

Durazzo-Pekinj line was opened to traffic there were reports that the projected extension to Elbasan would be another link in a line to reach Yugoslavia and to connect at Struga, at the northern end of Lake Ohrid, with the Yugoslav railways. Friction between the two countries is said to have caused the shelving of the scheme. A description of the Durazzo-Pekinj line was published in *The Railway Gazette* for April 16, 1948.

LUXEMBOURG

Rolling Stock from Germany

Negotiations are reported to be in progress between the National Railways and the Uerdingen wagon works in north-west Germany for the supply of "glass trains" and railbuses. Railbuses lent by the German Federal Railways have performed test runs on the

Luxembourg railways, the intention being to place orders in Germany should they be satisfactory.

WESTERN GERMANY

Double-Deck Coaches in Service

The first double-deck coaches of the Federal Railways were placed in service on December 20, when a semi-fast train, consisting of three of these coaches, with seating accommodation for 334 passengers, made its first run between Dortmund and Frankfurt-am-Main. The train operates every other day on this service.

It is hoped soon to operate the train daily, and it is stated that the Federal Railways may switch their entire building programme for semi-fast and fast train coaches to double-deckers if the results with these experimental coaches prove satisfactory.

Publications Received

Post Office, 1950. A Review of the Year's Activities. London: H.M. Stationery Office. 9½ in. x 7¼ in. 92 pp. Illustrated. Paper covers. Price 2s. 6d. net.—An account is given in concentrated form of the many and varied activities of the Post Office in 1950. Nothing of the sort has been published since 1934 and, as a compendium of up-to-date information on the working of all branches of a Government Department which comes into contact with the lives of everyone in the country, it should be a useful reference book. Each of the nine chapters deals with one aspect of Post Office work; that on inland posts makes brief mention of I.P.O.s on British Railways, and the chapter on overseas posts describes the expansion of air mail services. The booklet, including the sections on telecommunications and other technical matters, is clearly written, and the photographic illustrations well chosen and reproduced.

Specification for Heavy-Duty Electric Overhead Travelling Cranes for Use in Iron and Steel Works.—Prepared for the Steelworks Cranes Sub-Committee of the Plant Engineering Division, and published by the British Iron & Steel Research Association, 11 Park Lane, London, W.1. 11½ in. x 9 in. 58 pp. Price 15s. This was prepared with a view to obtaining some measure of standardisation as applied to electric overhead cranes employed on heavy duties in iron and steel works operating either under cover or in the open. The specification is applicable to cranes employed on ingot or slab handling and ground or overhead furnace charge handling machines. It may at the discretion of the purchaser be supplemented by additional clauses which are given in appendices. The specification, which will be of considerable assistance to both designers and intended purchasers, does not apply to ore

bridges or excavators, or to electric overhead cranes normally covered by B.S.466.

The Glasgow & South Western Railway: 1850-1923. Published by The Stephenson Locomotive Society. Obtainable from T. P. Hally Brown, 29, Waterloo Street, Glasgow, C.2. 8½ in. x 5½ in. 60 pp. Illustrated. Paper covers. Price 7s. 6d.—This historical account of the Glasgow & South Western Railway has been prepared to mark the centenary of the company, and the completion of the main line from Glasgow to Carlisle on October 28, 1850. A chronological review of the development of the system is followed by a history of the locomotives and rolling stock. Separate sections are devoted to steamships, docks and harbours, and the chief civil engineering works. Of particular interest are the reproductions of map from the first G. & S.W.R. timetable of October 28, 1850, and the front page of the timetable. The frontispiece illustration in colour shows one of the 4-6-0 engines designed by James Manson in 1903. The half-tone illustrations include a reproduction of the armorial device considered for the G. & S.W.R. in the early days, but not adopted, and the approach to St. Enoch Station, Glasgow, in 1879.

Four Main Lines. By Hamilton Ellis. London: Geo. Allen & Unwin Limited, Ruskin House, Museum Street, W.C.1. 9½ in. x 6½ in. 225 pp. Illustrated. Price 16s.—A journey on any of the main lines described will be a richer experience after reading this book. Its subjects are the west coast and east coast routes to Scotland, and the west of England main lines of the Great Western and the Southern. Each is treated with the command of evocative anecdote and pungent description that the author has applied so successfully before to railway narrative, with the result that each railway comes to life in the reader's mind equally vividly whether Mr. Ellis is writing of a

L.N.W.R. "Jumbo" coming up Camden bank with a heavy train, or of flying bombs over Waterloo.

It is a sign of the author's confidence in his style that when he has to bridge a gap in history without much material for his anecdotal method, he is not afraid to give an unadorned summary of facts. Then he plunges easily again into some characteristic passage of humorous observation, knocks down an idol or two, apologises to the devotees of his victims, and hurries on through another decade.

Eight colour plates by the author, mostly of "period" trains, lend support to the text in bringing the railways' past to life again, and there are many half-tone illustrations representing the development or persistence of locomotives, rolling stock, railway architecture, and civil engineering works.

Metrovick Fittings.—Information relating to commercial fittings, including ceiling units and pendants as well as illuminated signs and reflectors of various designs, is contained in an illustrated catalogue issued by the Metropolitan-Vickers Electrical Co. Ltd. Each type of fitting is given a catalogue number and approximate overall dimensions. A price supplement for use with the catalogue is also included.

Athermos Axleboxes.—An illustrated pamphlet which deals with the salient features of the latest design of Athermos axlebox has been issued by G. Stephenson & Co. Ltd., 13, Victoria Street, London, S.W.1, agents in Great Britain for the Société Internationale des Applications Isothermos. The illustrations include a sectional view, together with diagrams of the Athermos axlebox, and also oil flow and consumption graphs. There are illustrations depicting locomotives and rolling stock to which the axlebox has been fitted. The firm of Robert Hyde & Son Ltd., Stoke-on-Trent and Chesterfield, are the sole manufacturers.

at the sides, back, front, and combustion chamber.

The boiler is supported at the front of the firebox by oil lubricated expansion shoes attached to the foundation ring, contact being maintained with bearing slides fixed to the frame cross-stay by holding-down clips. A breathing plate is bolted to the frame cradle casting and back of the foundation ring, and frame deflection plates are located between the coupled wheels in order to reduce bending stresses in the frame.

Similarity to "WP" Class

For the purposes of interchangeability with the "WP" class locomotives, an alternative set of frame deflection angles is fitted to the boiler barrel. The cylindrical smokebox is fitted with the standard Indian door and self-cleaning spark arrester. The main steam pipes, blast pipe, chimney, and petticoat are of cast iron, and a cast-iron protector plate filled with fireclay is fitted below the smokebox tubeplate. The proportions of the chimney and draught arrangements are identical with those of the "WP" class. These have been found to be very satisfactory, and no alterations in design have been made except that the blast orifice has been reduced from 6 in. to 5½ in. The main steam pipes are 7 in. internal dia. and are considerably larger than is usual for the size of cylinder.

A 38-element Melesco superheater equipped with an anti-vacuum valve is fitted, and a Joco regulator situated in the dome is operated by a ramshorn handle; the internal steam pipe is 7½ in. inside dia. An I.R.S. finger pattern rocking grate is fitted, designed for rocking by hand in four sections.

The ashpan is in two portions, of all-welded construction, equipped with double hopper doors and provided with ash-drench fittings. The upper portion of the pan is suspended from the foundation ring and the lower portion attached to the frame cradle casting. An inward opening I.R.S. firedoor of heat-resisting alloy steel is fitted and provision has been made in the design of the back end of the engine and front of tender for fitting a mechanical stoker if required.

Asbestos mattresses are applied to the firebox back and sides for a distance of 1 ft. 0 in. beyond the cab. The boiler and firebox shell is fitted with crinoline bars and hoops on which mild-steel sheets are secured by stainless steel bands. The cylinders are also lagged with asbestos mattresses and covered with mild-steel sheets.

General steam fittings include two I.R.S. pattern 12 mm. injectors, three 3 in. dia. Ross pop safety valves, two 1½ in. "Everlasting" blow-off cocks—one on the manhole and one fitted on the front of the firebox—and two sets of water gauges and protectors. The main steam stand, situated on top of the firebox outside the cab, is fitted with main stop valve and valves for injectors, vacuum brake, lubricator, blower, drift-ing, turbo-generator, and whistle. A

top feed clackbox to I.R.S. pattern is fitted on the first barrel ring. Steel pipes have been used to the greatest extent possible.

Engine Design Features

The frames are machined from rolled slab, and finished to a thickness of 4½ in. The rear of the frame consists of a one-piece cradle steel casting securely attached to the bar frame by turned fitted bolts. The front dragbox and buffer beam are combined in one steel casting which is also secured to the bar frames by fitted bolts. Cross staying is provided by cast-steel cross stretchers, and the frame pedestal wedges and shoes are steel forgings fitted with renewable manganese steel liners.

Coupled axleboxes are of lead bronze fitted with Ajax keeps and grease lubricators, the flanges of the boxes being of sufficient thickness to allow for the fitting of channel liners after wear; renewable bronze liners are provided on the hub faces. Laminated bearing springs are fitted and are of the overhung type. Spring compensation is arranged in two groups, that is, between front truck, leading and intermediate wheels, and between driving, trailing, and hind truck wheels.

The spring hangers are fitted with shoes and cotters; auxiliary rubber springs are also provided. I.R.S. central drawhooks and screw couplings and side buffers are fitted at the front of the engine and at the rear of the tender. The drawhook springs are made of silico-manganese steel.

Wheel Design

The coupled wheel centres are steel castings of the spoke type with triangular rim section. The tyres, manufactured to Indian standard profile, are secured by clips welded in position. This type of tyre fastening was introduced on the American-built "WP" Pacifics, but will be modified on the later "WG" class engines to rivet fastening at every alternate spoke. Solid balance weights with pockets for adjustment are provided, with the exception of the driving wheels, which are hollow cast and lead filled with adjusting pockets.

The whole of the revolving masses and 52 per cent. of the reciprocating parts are balanced, the distribution of the reciprocating balance being 14, 15, 10, and 13 per cent. respectively in the leading, intermediate driving, and trailing wheels. The inner hub faces of the wheels are fitted with renewable manganese-steel liners and lubricated by soft grease through the wheel hubs.

The cylinders are of cast steel jointed on the vertical centre line, and are integral with the smokebox saddle. Renewable cast-iron liners are fitted to the cylinder barrels and steam chest. The hind covers are steel castings, while the front covers are of cast iron with breaking grooves in the cylinder covers. The piston heads consist of a steel forging with cast-iron bull rings. Three piston rings are fitted. N.C. type bye-pass valves are fitted to the steam chests, and piston rod packing is of the Brittlie

type. Lubrication is provided by a 5-feed Wakefield "AC" type lubricator, a spare feed being provided for use should a mechanical stoker be fitted at a later date.

Steam distribution is effected by 12 in. dia. piston valves actuated by Walschaerts valve gear. The piston valves have a maximum travel of 7½ in. and a cut-off at 80 per cent. in full forward gear. Alligator type crossheads are fitted and attached to the piston rods by means of a double cone on the end of the rod, which is itself clamped into position by a split conical gland. A pressure plate is secured to the cross-head by six studs of 1½ in. dia.

Bronze floating bushes, lubricated by hard grease, are fitted to the coupling and connecting rods. The motion has cast-iron bushes, and is lubricated with soft grease, and roller bearings are fitted to the ends of the eccentric rods. Hand reversing is provided, and the reversing rod, made of weldless steel tubing, is supported by brackets attached to the boiler.

The leading and hind trucks of the locomotives are fitted with roller bearings of varying design; 45 have Timken, 45 Skefco and ten Hoffmann bearing axleboxes. Cannon type axleboxes are fitted to the leading truck. The load is applied to friction fabric liners on top of the axlebox casting through bearing pads fitted with manganese steel liners; side control is of the spring type.

The hind truck, which is interchangeable with the "WP" class locomotives, is of radial arm design with outside roller bearing axleboxes and spring control side check gear, which limits the total side play of the leading and trailing trucks to 6½ in. and 5 in. respectively, and allows curves of 573 ft. radius to be negotiated. Disc type wheel centres with pressed-on tyres are fitted on both leading and trailing trucks.

Cab and Tender Design

The cab, of welded construction, is fitted with a double roof with open air space between. The outer roof is of steel plate and the inner roof of wood. To facilitate erection of pipes to the steam stand the roof is bolted to the cab sides and front plates. Windows are provided in the front plates and sliding steel louvred shutters in wooden frames are fitted on the cab sides. The enginemen's platform is extended close to the tender shovel plate and provided with suitable skirting plates.

Steam brake equipment is fitted on the engine and actuate blocks on the rear of all coupled wheels. Vacuum brake is provided for the tender and train, the ejector being the Gresham & Craven SJ(G) type, with graduatable automatic steam brake valve. Efficient means of gravity sanding is provided to sand at front of leading and trailing wheels. The sandbox is mounted on the boiler barrel and gearing is hand operated from the cab. Stone's electric lighting equipment is provided which includes a 14 in. Tonum "E" headlight, cab lamps for lubricator, water gauges

pressure gauge, and a lamp to illuminate the bunker.

The tender, which is of the double four-wheel bogie type, has been designed for a water capacity of 5,000 gal. and 18 tons of coal, with a space reserved for fitting a mechanical stoker. In the tenders as built the stoker compartment is filled with water and a skirt is provided at the filling hole to ensure that the water capacity will not exceed 5,000 gal. In the event of a stoker being fitted, with consequent loss of water in the compartment, the skirt can be adjusted to give the required water capacity for maximum axleload.

The tank and bunker shell is of welded construction, but angles for stays and wash plates are riveted to the tank. The tender underframe is built up of longitudinal channels, and

is well stayed in all directions by cross channels, steel plates, and sections. The connections between engine and tender consist of a drawbar, safety drawbar, and spring loaded rubbing block bearing on a facing strip on the engine hind buffer beam.

The bogie frames are steel castings with attachments for brake and spring gear and fitted with manganese liners on the pedestal guides. Roller bearing axleboxes are provided as on the engine trucks, 45 with Timken, 45 with Skefco, and ten with Hoffmann. Disc type wheels with shrunk-on tyres are fitted and two 24 in. dia. vacuum cylinders actuate blocks on the inside of all bogie wheels. A hand brake is also provided. All necessary screw keys, firing tools, oil lamps, and grease equipment are provided with each locomotive.

The principal dimensions of the locomotives are as follow:—

Cylinders, dia. and stroke	21½ in. x 28 in.
Wheels, coupled, dia.	5 ft. 1½ in.
“ front truck, dia.	3 ft. 0 in.
“ hind truck, dia.	3 ft. 7 in.
“ tender bogie, dia.	3 ft. 7 in.
Wheelbase, coupled	17 ft. 1 in.
“ engine	36 ft. 3 in.
“ engine and tender	68 ft. 6 in.
Height, rail level to boiler centre	9 ft. 6 in.
“ “ top of chimney	13 ft. 10½ in.
Heating surfaces—	
Tubes	1,962 sq. ft.
Firebox, including syphon and arch tubes	275 “
Total evaporative	2,237 “
Superheater	683 “
Total	2,920 “
Grate area	45 “
Boiler pressure	210 lb. per sq. in.
Weight of engine in working order	101 tons 17 cwt.
“ tender in working order	71 tons 16 cwt.
“ engine and tender in working order	173 tons 13 cwt.
Adhesive weight	73 tons 12 cwt.
Adhesive factor at 85 per cent. boiler pressure	4.2
Tractive effort at 85 per cent. boiler pressure	38,890 lb.

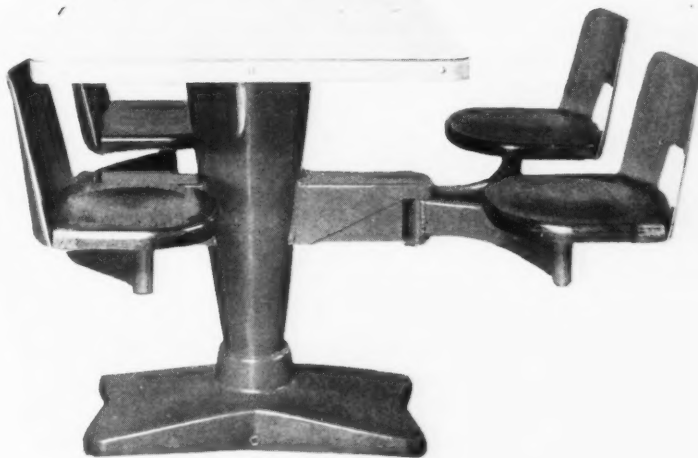
The “Twenty-to-One” Table

A space- and labour-saving design of table and seats in one

A MODERN idea in space economy is the “Twenty-to-One” table, manufactured by Twenty-to-One Tables Limited, 16, Bolton Street, London, W.1. It consists of a table and four seats in one unit; the seats have no legs but are supported on curved arms connected to a single central table leg. As the seats pivot on the ends of the arms, which are free to swing, they may be pushed in close to the table when not in use.

One of the main advantages of the design is that the floor can be cleaned while the tables and seats are in use, and thus the unhygienic practice of standing chairs on tables while the floor is washed, is obviated. The compactness of the design gives about 10 per cent. more seating accommodation in a room, as the tables can be set closer than ordinary tables with separate chairs. There are no chair legs to scrape and scratch the floor, and the room always presents an orderly appearance, with no loose chairs to get out of place.

The absence of chair legs allows more freedom of movement and leg room to the person seated. The solidity of the design means that the unit will last longer than separate tables, with wooden chairs. The unit can be supplied in almost any colour and variety of table surface to harmonise with the decorations of the room. In the latest



The unit, showing seats on right in position for use, and those on left pushed in close to table when out of use

design the seat backs are rounded and filled in. The unit should be especially suitable for restaurants, canteens, and ships, and has been adopted in the

London Transport canteen at Vauxhall. It seems to have much to recommend it for use in railway restaurant and buffet cars, and in refreshment rooms.

ELECTRICALLY DRIVEN POINT OPERATING MACHINES FOR RAILWAYS.—This British standard (B.S. 581:1950) is a revision of the 1934 edition, and covers electrically driven machines for operating railway points, derailleurs, movable diamonds, and facing point or fouling bars. The main amendments are as follow:—(a) Hand generator machines are recognised as a

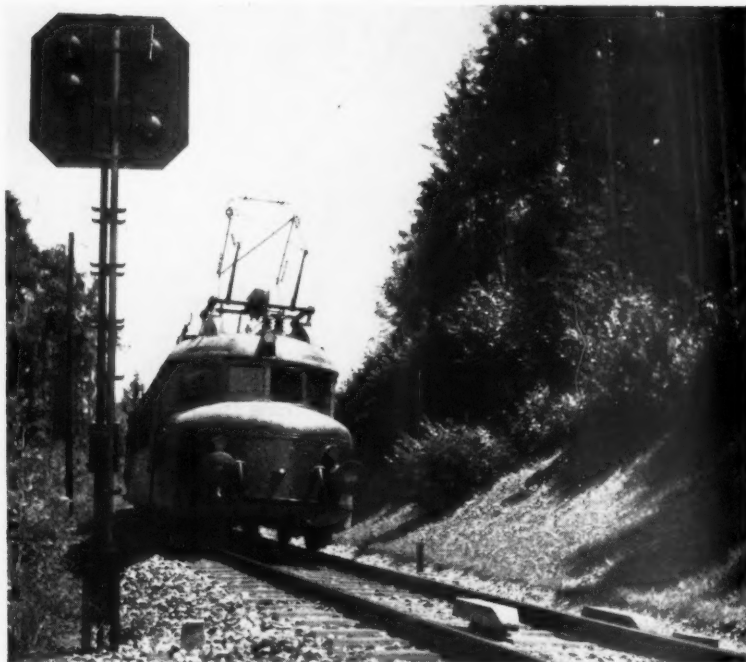
standard type; (b) the low-speed low-voltage machine is no longer recognised as standard; (c) the standard has been enlarged to cover different performance requirements for identical machines required for use with both bull-head and flat-bottom switches; (d) an insulation resistance test is specified as a routine test. The standard lays down the sequence of operations and

the standard voltages, and also gives requirement for general construction and protection from weather, for the motor, wiring, and terminals, manual operation, and performance. Copies of this new standard may be obtained from the British Standards Institution, Sales Department, 24, Victoria Street, London, S.W.1, price 2s. each.

Inductive Automatic Train Control in Switzerland

In 1934 the Swiss Federal Railways commenced the installation of automatic train control now in general use throughout the system

By Dr. Karl Oehler-Gutzwiller, Special Lecturer, Federal Technical College, Zurich



Track inductors at colour-light distant signal

ALTHOUGH it is generally known that a system of automatic train control is in use in Switzerland, outside that country, particularly outside the Continent, many misconceptions are entertained concerning it, about the experience gained with it, and its applicability to other railway systems.

A few years after the 1914-18 war, as a result of serious accidents caused by signals being disregarded, the management of the Swiss Federal Railways investigated the problem of automatic train control and the details of all the systems known at that time, with a view to their possible adoption. These investigations included tests of all the Continental systems and a study of the apparatus of various kinds developed in America and Great Britain. They led to the conclusion that the following requirements needed to be fulfilled by a system adapted to modern conditions:—

- (1) Reliable operation at high speed.
- (2) Avoidance of all direct contact between the apparatus on the track and that carried on the train.
- (3) Avoidance of equipment subject to wear and tear.
- (4) Freedom from influence by masses of iron, such as points and crossings, bridge girders, and so on, or the effects of extraneous currents, from traction or other sources.
- (5) Avoidance of apparatus needing

permanent supervision and maintenance, particularly as regards special sources of power supply at the signals.

- (6) Adaptability to all types of signal, mechanical or electrical.

New System Developed

As none of the existing systems was able to meet all these requirements, the Swiss signalling industry, during several years of research, developed the completely new Metrum system, which became known generally under the name of Signum, then the actual manufacturers. The management of the Swiss Federal Railways encouraged its development in every way, and arranged for extended tests and trials. In this, an engineer, Herr F. Steiner, now head of the Traffic Section of the Federal Railways and Postal Service Ministry, then chief of the Operating & Repair Shops Service, rendered outstanding assistance.

This Metrum system is based on transmitting signals by induction, since only a system functioning in this way could fulfil both the principal requirements of eliminating all mechanical contact between the apparatus on the permanent way and the train, and also all local sources of power along the line. As at that time, however, all known inductive systems possessed the disadvantage that large masses of iron of any kind could produce false indications, entirely new methods of working were

developed, resulting in the most important features of the Metrum system, a double transmission of impulses, or a magnetic separation between the exciting, or inducing, part of the equipment and the receiving part. Fig. 1 shows the principle of this arrangement.

An exciting, or inducing, magnet or inductor, E1, permanently energised from a battery on the locomotive, passes over a relaying or transmitting magnet U1 when a signal is being passed, and induces a potential in it. If the short-circuit connection to the second relaying magnet, U2, is open at the contact K, operated by the signal, a current will be caused to flow and will

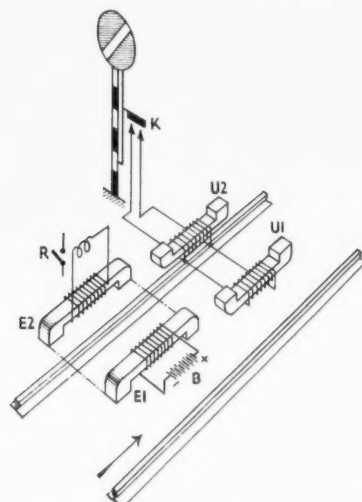


Fig. 1—Principle of operation of Metrum system

build up a field in U2. This field will give rise to an impulse of current in the receiving magnet, E2, which in turn will actuate the receiving relay.

The contacts on this in conjunction with other relays produce the required action on the locomotive in agreement with the signal indications. The gap between the magnets on the track and those on the locomotive is in practice about $3\frac{1}{2}$ in. Experiments have shown that the transmission of the impulses is effected unfailingly even at a speed as high as 115 m.p.h. In this way the basic problem of transmitting signalling impulses to a moving train, in accordance with the requirements set forth above, was solved satisfactorily.

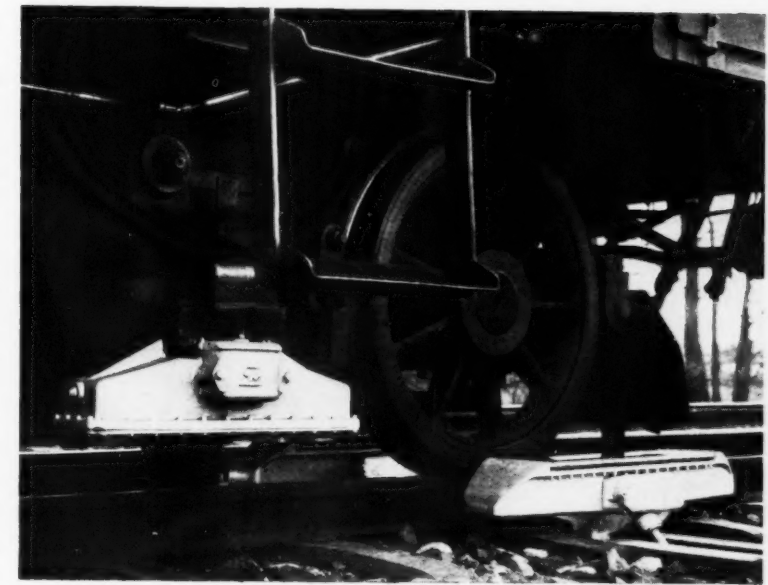
Making use of this method, after several years of further experiment, the Swiss Federal Railways decided in 1934 to equip all electric locomotives and install apparatus at all the outer distant signals on the electrified lines, which meant the majority of the routes. (It

should be understood that in Switzerland all home signals and starting signals have their own distant signals and that the distant signal in rear of a home signal can be cleared with the starting signal at danger.)

This rendered it permissible to introduce the one-man drive on the locomotives, and the yearly savings so obtained exceeded, after a short time, the total cost of installing the automatic train control. As a second stage in this work, now approaching completion, the inner distant signals (repeating the starting signals) and the starting signals themselves at stations have been equipped, so that more than 95 per cent. of the Federal Railways system is now fitted. Only a few steam-worked secondary lines and one electric narrow-gauge section are excluded. Today more than 3,000 signals and about 600 electric locomotives, railcars, and diesel locomotives belonging to the Federal Railways, as well as a number of locomotives belonging to private companies, are fitted with automatic train control apparatus.

General Principles

Because of the long braking distances necessary at high speeds, the point where the signal must be transmitted to the driver, and where he must take action, depends on the location of the stop and distant signals. The distant signal is the governing signal, particularly as the danger zone may lie only a short distance ahead of the stop signal, and, therefore, on the Swiss Federal lines an impulse was only transmitted to the train when a distant signal was passed at "caution." This principle was departed from, however, when it was decided to equip the starting signals, though as in this case it was mainly a question of attracting the attention of the driver when starting from rest to the



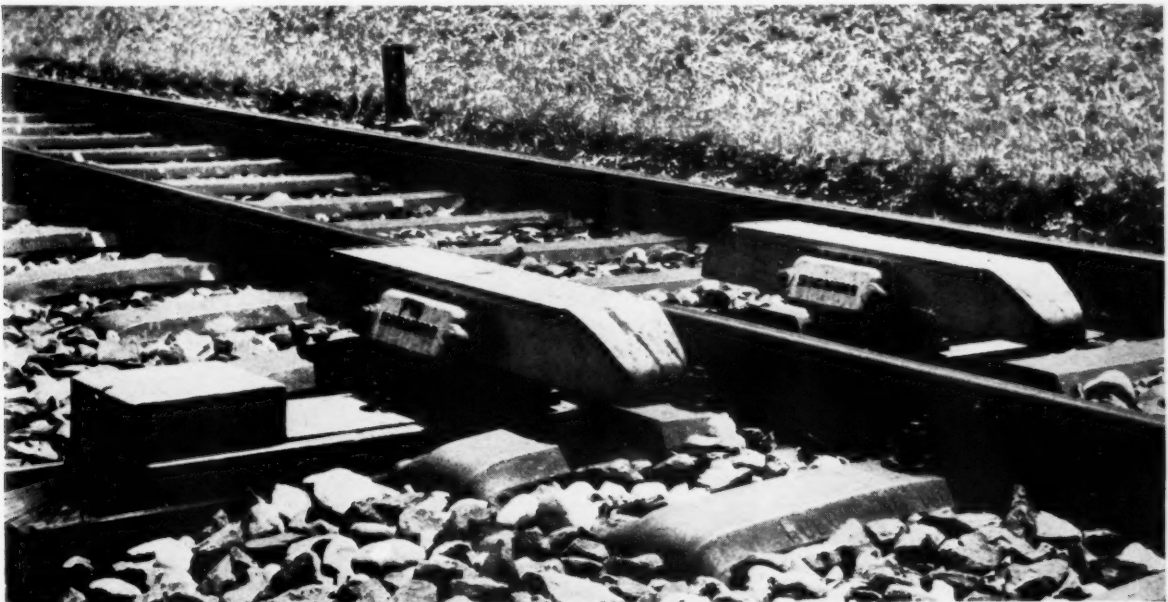
Receiving inductor on locomotive and track inductor

obvious fact that he was over-running a "stop" indication. This was considered permissible as a speed just after starting from rest would still be low, whilst a non-stop train would already have been warned by two previous signals equipped with inductors.

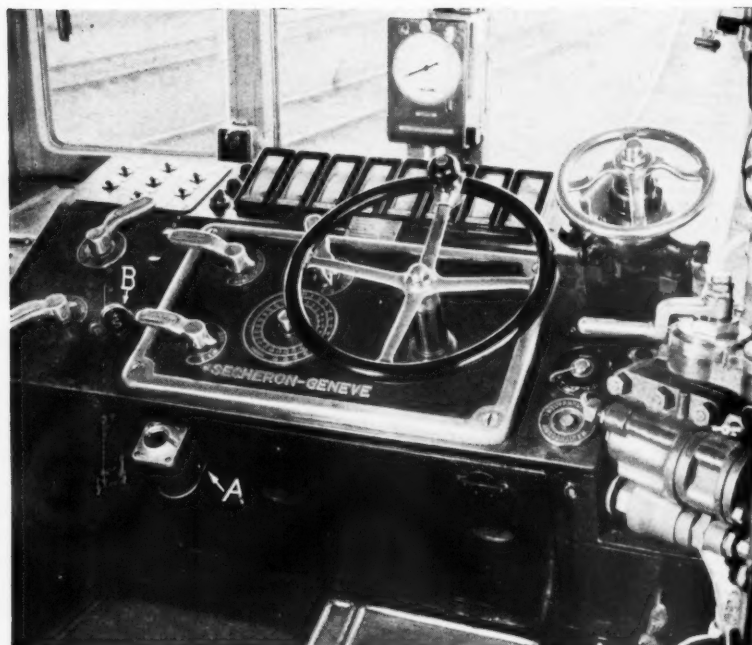
To keep the installation simple the Federal Railways decided to use only one indication on the locomotive, i.e., with either a distant signal at caution or a starting signal at danger an impulse would be transmitted to the train. This impulse acts in such a way that, first, an audible signal is sounded in the driver's cab, and then, if he takes no action, the emergency brakes are applied after

the train has travelled about 60 yd. This is effected through the same mechanism as that actuated by the "deadman" handle. The driver is able, however, by pressing a re-setting switch, to prevent this braking from taking place and can then make use of the ordinary braking in the usual way.

Originally, on the Swiss Federal Railways, the driver's instructions were that he was to actuate this switch before passing a distant signal at "caution" so that the automatic train control would not come into operation. This was in conformity with the original idea that it should be in the first place a reminder to the driver and would only be re-



Track equipment for automatic train control on Swiss Federal Railways



Driver's cab of electric locomotive showing resetting switch (A) and proving circuit lamp (B)

quired to function if he were unable to, or did not, act. It appeared later that this was likely to lead to some drivers depressing the switch instinctively and thus putting the equipment out of action without making sure that the signal had been seen.

The instructions were therefore altered to require the driver to allow the apparatus to come into action before operating the switch, which must now be done only if the signal is at "caution," and even then only after the train control has commenced to function. This results also in proving the whole apparatus, and incidentally, illustrates how the psychological point of view must always be taken into account.

As most trains stop at all stations, and therefore find the inner distant signal at "caution," an almost constant check on the entire equipment is obtained. (In Switzerland, contrary to the practice in Great Britain, when a train is booked to stop the starting signal is kept at danger until it has arrived in the station.) This is the more desirable as the type of Metrum apparatus adopted by the Federal Railways does not yet incorporate constant proving of the receiver circuit, nor any automatic testing of the track equipment every time a train passes.

Practical Experience Gained

Practical experience has given convincing proof of the correctness of the basic ideas of the Metrum system and that all the principal conditions previously mentioned are catered for. This experience has been gained over a period of 15 years, not counting the experimental period, and forms a solid foundation on which to judge, if it is

realised how often during that time the apparatus on each engine and at each

signal has operated. Not a single accident has occurred due to disregarding a signal fitted with the apparatus, nor has any fault developed, while some accidents which did occur would have been prevented if the signals involved had been fitted. It must be further borne in mind that since the apparatus was introduced the speed of the trains and density of traffic have both increased.

It is of special importance to note that the Metrum system requires no periodic inspection of, or maintenance work on, the track equipment, while the engine apparatus need be inspected only during general servicing. Every time a locomotive leaves its depot the working of its equipment is proved by passing over a permanent magnet.

On the Swiss Federal Railways the inner relaying magnet lies perpendicularly below the couplings of the vehicles, and as sometimes, contrary to regulation, on the last one they are left hanging down, some magnet housings receive quite heavy blows in the course of time. The first thorough inspection carried out, after 15 years in service, has shown, however, that only minute damage had occurred which might have led to trouble in the course of time, showing that design, construction, and manufacture have been alike efficient.

An interesting feature of the Metrum system is that by making use of light portable permanent magnets, it is pos-



Approach permanent magnet and inductors at an automatic signal

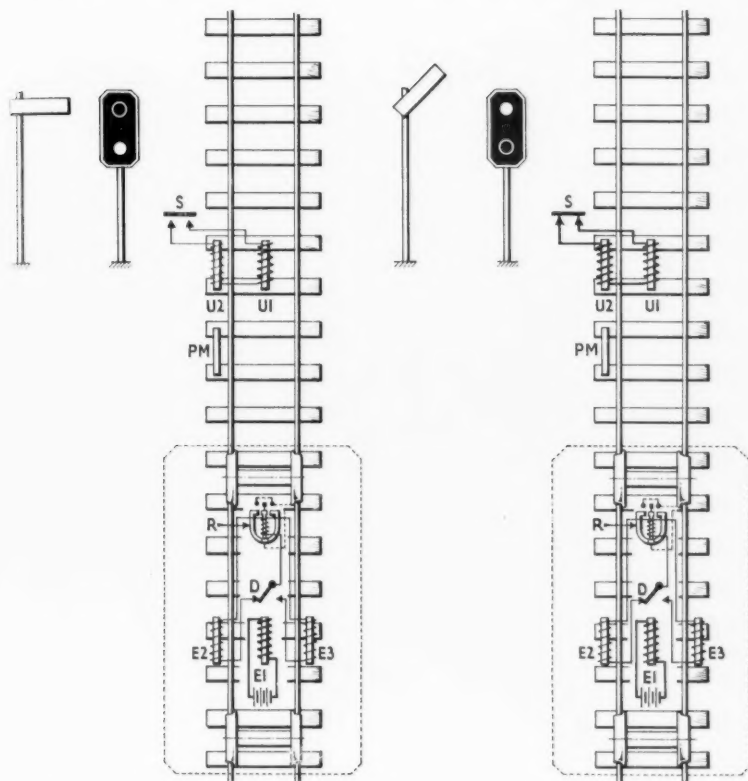


Fig. 2—Improved arrangement using a permanent magnet on the track

sible to transmit an impulse to a train at any point along the line, should this be necessary for some special purpose, and on the Swiss Federal Railways this is done in conjunction with speed restrictions, where repair or maintenance work is in progress, thus enforcing observation of the signals exhibited to protect such places.

Further Developments

At the outset the management, desirous of having simple equipment, decided not to call for a system in which the locomotive apparatus circuits were proved continuously and the track apparatus every time a signal was passed, as at that time this appeared possible only by adding complicated and expensive apparatus. Because the new system offered considerable advantages compared with previous ones, it was easy to adopt this course for the time being.

The development of the Metrum system was nevertheless continued and efforts directed towards meeting these additional requirements simply and economically. To provide constant proving of the receiver circuits a proving current, controlled by the main relays, was arranged to flow through the windings of the receiver relay and receiving magnet, or inductor, in such a way that the resultant magnetic fields neutralised each other and therefore were without effect on the impulses transmitted to the receiving magnet by

the second relaying magnet on the track.

Any short-circuit or breakage of a wire in the main circuit causes the main relay to drop away as if a "stop" signal had been passed. It is then impossible to use the re-setting switch, and the automatic train control must be cut out before the train is able to resume its journey. This is effected by means of a sealed switch, beyond the direct reach of the driver, which serves forcibly to remind him that he is running without the protection normally afforded by the apparatus.

Another important improvement was to effect, also in a simple way, the

proving of the track magnet circuits. After some decisive experience gained with portable permanent magnets already mentioned an obvious step was to use such a magnet for this purpose. This is placed several yards on the approach side of the ordinary track magnet, and induces an impulse in the engine receiver magnet, which in turn operates the receiver relay.

This operation corresponds to a "stop" or "caution" indication, as the case may be, and is stored in the engine apparatus. Assuming, however, that the signal is at "proceed," a second impulse is transmitted to the train when it passes the track magnet, and this cancels the action of the first one. If this second impulse is not received, however, the engine apparatus will, after the lapse of a few seconds, or after the train has travelled a pre-determined distance, operate in the sense of a "stop" or "caution" indication. These stages in the working of the equipment are shown in Fig. 2 and it will be seen that "proceed" can only be transmitted to the engine if the circuits of the track apparatus are in proper order. In this way the equipment is proved every time a signal is passed.

The proving of the receiver circuit is not shown for the sake of clearness. The second receiver magnet, E3, however, brought into operation by switch D when running in the reverse direction, is shown. The improvement on the original system effected by these two patented additions, is known, for purposes of distinction, as the Integra-Metrum system. (In *The Railway Gazette* for March 10, 1950, in an article by Mr. J. E. Mott, this arrangement is incorrectly called the Stin-Metrum system, which is actually a further Swiss development, along the same lines as the Integra-Metrum apparatus but using two separate receiver circuits, one for the first impulse, the other for the cancelling impulse. It is of use only in special cases.)

Multiple-Aspect Arrangement

From 1936 to 1939 a development of the Metrum system, adapting it to three-aspect signalling, was installed on the former Alsace-Lorraine Railways, and the Integra-Metrum system now makes

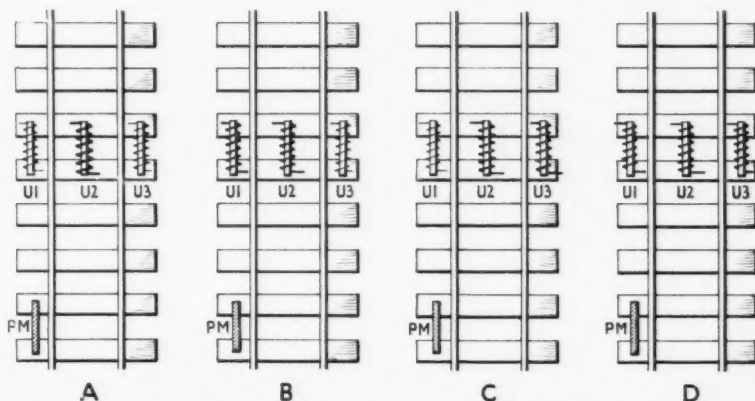
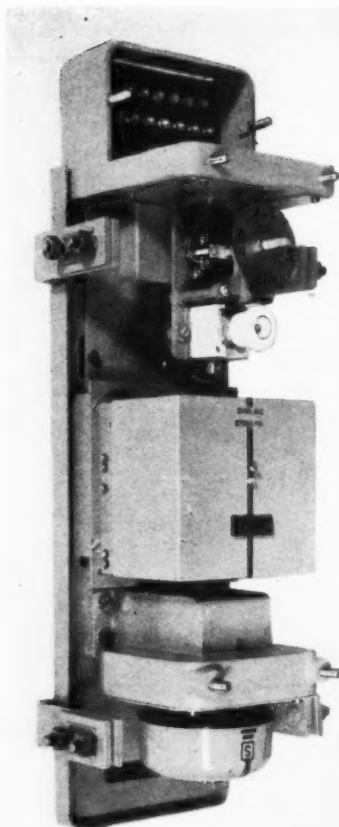


Fig. 3—Multiple-aspect arrangement



*Apparatus case in locomotive cab,
with cover removed*

it possible to cover four aspects in a simple manner.

The main components of the engine equipment are the same as those used for the transmission of only two signal aspects, insofar as the second receiver magnet, E3 (Fig. 2), for both directions of running is included, while on the track only one further magnet or inductor, U3, is required. The cost of transmitting four signal aspects is thus less than one-third more than that of transmitting two.

Fig. 3 shows the principles of the working of the track magnets with the signal showing the various indications possible. At A the impulse received from the permanent magnet is not cancelled ("stop") whereas at B this occurs through the track magnets U and U2 (e.g., "caution") and in sketch C through U2 and U3 ("proceed at reduced speed" or "preliminary caution"). In the final example at D, all three track magnets U1, U2, and U3, act simultaneously to cancel the impulse received from the permanent magnet and thus transmit the indication of "proceed."

With this arrangement any one of four signal aspects can be transmitted to the train by using one or more permanent magnets at any point in the

section, which is useful in the case of providing temporary protection for portions of line under repair or for imposing a permanent speed restriction at other points of danger, such as sharp curves or steep falling gradients.

The way in which the impulses transmitted to the engine are to be used, that is to say, in what manner the different signal aspects have to influence the running of the train, is dependent on the practice obtaining on any particular railway. Modern circuit design is able to meet a great variety of possibilities. There are now available, for example, means of enforcing automatically a reduction of speed to a given limit, as well as of producing an emergency brake application.

The receiver circuit on the engine is continuously proved so that any fault becomes immediately indicated. The apparatus on the track does not require a source of power at the signal, and the cost of providing one and maintaining the equipment are obviated.

There is practically no speed limit restriction and reliable action is assured

at any speeds which may be anticipated in the future.

The transmission of four signal aspects is possible by simple means, which is of considerable significance, seeing that four-aspect signalling may come into use more and more on main lines.

The Swiss Federal Railways showed considerable foresight in deciding in the middle of the crisis period of the 1930's to equip their entire system and they were, and remain, the only State railway to show such initiative and carry the work to a successful conclusion.

CLOSING OF GOODS STATIONS: SCOTTISH REGION.—It is announced by the Scottish Region of British Railways that, as from February 5, Newmains and Morningside (L.M.S.) goods stations—which at present deal with full wagon load freight train traffic—will be closed and traffic will cease to pass over the Newmains branch. All full wagon load freight train traffic for Newmains and Morningside will be dealt with at Morningside (L.N.E.R.), at which station adequate facilities exist.



Home signal with inner distant signal, and inductors for transmitting up to four indications

RAILWAY NEWS SECTION

PERSONAL

Mr. Harold Young, Chief Mechanical Engineer, New South Wales Government Railways, has retired, and has been succeeded by Mr. W. H. Armstrong, formerly Assistant Chief Mechanical Engineer.

Mr. L. J. Hamblin, Assistant Divisional Superintendent, Paddington, Western Region, has been appointed District Operating Superintendent, Worcester.

from Kirkuk to Erbil, which has recently been completed. Mr. Moffatt's responsibilities also include administration of the Iraqi Airways.

Sir E. A. S. Bell, though retaining his seat on the board, has resigned the Chairmanship of the Barsi Light Railway Co. Ltd. Mr. P. H. Maflin has been elected as Chairman and Mr. J. A. Bell has been appointed an additional Director of the company.

interest in the Cordoba Central Railway, Entre Rios Railways, Argentine North Eastern Railway, Rosario-Puerto Belgrano Railway, and a number of industrial concerns. On the outbreak of war in 1914, the Argentine Railways Company was dissolved and Mr. Cabrett continued as General Manager of the Cordoba Central Railway until 1931, when he became Chairman of the Local Board; he retired in 1937. He was for some years Chairman of the Argentine Railway Clearing House



Mr. W. J. Moffatt

Who has been confirmed in the post of Director General, Iraqi State Railways

Mr. W. J. Moffatt, B.A., B.A.I., M.I.C.E., Deputy Director-General, Iraqi State Railways, who has been acting as Director General, and, as recorded in our December 1, issue, has been confirmed in that post, was born in Dublin and graduated in arts and engineering at Dublin University in 1915. He was commissioned in the Royal Engineers in the first World war and saw service in France and Palestine. On demobilisation Mr. Moffatt joined the Mesopotamian Railways (later Iraqi State Railways) and served in the Engineering Department in various capacities throughout the system. In 1939 Mr. Moffatt was appointed Chief Engineer and he became Deputy Director-General in 1948. During his service, Mr. Moffatt has been responsible for a variety of construction works. These include the extension of the standard-gauge line from Baiji to Mosul between 1938 and 1940, and the link-up with the Syrian Railways at Tel-Kotchek, a total distance of 200 miles; and the 65 miles extension of the metre-gauge line

British Railways, North Eastern Region, has announced that Mr. H. Eagers, formerly Assistant District Engineer, Darlington, has been appointed District Engineer, Hull.

We regret to record the death in Buenos Aires of Mr. H. G. Cabrett, a former Chairman of the Local Board of the Cordoba Central Railway, Argentina. He was born in Buckinghamshire in 1862, and after sailing for the Argentine in 1887, joined the staff of the Argentine Great Western Railway. Shortly afterwards he transferred to the Transandine Railway and became General Manager at the time when the first 60 km. of line was opened. In 1892 Mr. Cabrett joined the Central Argentine Railway and following the fusion of the Central Argentine and Buenos Ayres & Rosario companies in 1902 he became General Superintendent of the combined lines. In 1912 he was appointed General Manager of the Argentine Railways Company, which held a controlling

and was, at one time, a member of the Argentine Government Commission on bridges and roads giving access to railway stations.

We regret to record the death on January 13, at the age of 82, of Mr. George Richards, F.C.H., B.A., M.I.C.E., one time Chief Engineer to the Indian Railway Board.

The Canadian Pacific Railway has announced that Mr. N. R. McMorran has been appointed Traffic Manager for Australia, with offices situated in Sydney, New South Wales, and Mr. A. W. Essex has been appointed Traffic Manager for New Zealand, with offices situated in Auckland.

We regret to record the death on January 3, at the age of 75, of Mr. Arthur White, O.B.E., who retired as Divisional Superintendent, London (East) Division, Southern Railway, in 1936.



The late Mr. H. G. Cabrett

Chairman, Local Board, Cordoba Central Railway, Argentina, 1931-37



Mr. T. E. Bourdillon

Chief Engineer, Rhodesia Railways
1948-50



Mr. D. F. Gowen

Appointed Executive Officer (Salaried Staff),
Railway Executive



Mr. A. Collingwood Lermitt

Works Secretary, the Vulcan Foundry Limited,
1910-50

Mr. T. E. Bourdillon, B.A.(Cantab.), M.I.C.E., A.M.Inst.T., who has retired from the position of Chief Engineer, Rhodesia Railways, was born at Bath, Somerset, and educated in South Africa and at Brighton College, England. During the first world war he served with the Royal Sussex Regiment and attained the rank of Captain. He obtained his degree at Cambridge in 1921 and proceeded to India, where he took up the position of Assistant Engineer with the Jodhpur & Bikaner Railway. In 1925 he received a similar appointment on the Rhodesia Railways, and from 1926 was engaged on survey and construction duties. Between 1926 and 1928 he was Resident Engineer in charge of construction of the Shabani branch line (63 miles), and subsequently developed the departmental organisation which undertook construction of the Lamagandi branch extension to Lions Den (21 miles) and the Kildonan branch (23 miles). He was Resident Engineer on the reconstruction of the main line between Wankie and Victoria Falls from 1930 to 1932, and later was appointed District Engineer, Gwelo. In 1944 he became District Engineer, Salisbury, and he was appointed Assistant Chief Engineer in 1946. Mr. Bourdillon became Chief Engineer in 1948.

Mr. Thomas Marsland, Chief Mechanical Engineer, Western Australian Government Railways, is in England on leave.

We regret to record the death on January 4 of Mr. A. C. Low, C.B.E., Secretary of the Engineering & Allied Employers National Federation.

Mr. J. Muir, formerly of the Technical & Scientific Register of the Ministry of Labour, has been appointed Registrar & Secretary of the Professional Engineers Appointments Bureau, 9, Victoria Street, Westminster, in succession to Mr. H. J. Nichols, who has resigned.

Messrs. F. May, Secretary; L. Halpin, Sales Manager; and John H. Osborn have been appointed local Directors of Samuel Osborn & Co. Ltd. Mr. E. Pasley, Chief Metallurgist, and Mr. H. Dakin, Forge Manager, have been appointed Directors

of the Titanic Steel Co. Ltd. Mr. W. T. Hill, Commercial Manager, has been appointed a Director of the Osborn Foundry & Engineering Co. Ltd.

Mr. D. F. Gowen, Staff Officer (Salaried Staff), Railway Executive, who, as recorded in our December 22 issue, has been appointed Executive Officer (Salaried Staff), joined the Great Eastern Railway in 1916 and after experience at various stations in East Anglia was transferred to the Chief General Manager's Office, L.N.E.R., in 1924. From 1932 to 1942 he occupied a number of staff posts at Hull and York and in 1942 was appointed Assistant in the Chief General Manager's Office in London. In January, 1948, Mr. Gowen was transferred to the Railway Executive Headquarters as Assistant to the Chief Officer (Staff & Establishment) and in January, 1949, became Staff Officer (Salaried Staff).

Mr. Robert T. Russell, Chief Designing Engineer, New South Wales Government Railways, is on a business visit to England.

LUNCHEON TO LORD INMAN

A luncheon was given at the Dorchester Hotel, London, on January 11, at which Sir Harry Methven presided, to pay tribute to Lord Inman, the retiring Chairman of the Hotels Executive, British Transport Commission. The Members and Officers of the Executive presented Lord Inman with a case of pipes as a farewell gift.

Mr. C. E. Burton, Chief Designer, Transport Equipment (Thornycroft) Limited, has recently returned from a visit to Iraq, Syria, Lebanon, Persian Gulf, South Africa and Southern Rhodesia.

Mr. A. Collingwood Lermitt, who, as recorded in our January 12 issue, has relinquished his position as Works Secretary, the Vulcan Foundry Limited, was educated at Kingsgate House, Winchester, and on leaving school spent two years in France learning the language. He joined the Vulcan Foundry Limited in 1907 as Assistant to the Works Secretary, and he was appointed Works Secretary in 1910. Since 1936 Mr. Lermitt has represented the Vulcan Foundry at meetings of the Locomotive Manufacturers' Association and he

has served on numerous sub-committees of the Association. He has acted as Honorary Secretary of the Vulcan Institute Committee since its inception in January, 1946, and has always taken an interest in social activities connected with the Institute and in matters concerning the Vulcan Village Housing Estate & School.

Major-General Sir Donald J. McMullen, Director, Peruvian Corporation Limited, left London by air for Lima today, January 19, on a visit to the corporation's railways and other properties; he expects to arrive back at Southampton on April 5.

We regret to record the death on January 13 of Dr. H. R. Wright, Chairman & Managing Director of Siemens Brothers & Co. Ltd., and Chairman of Siemens and General Electric Railway Signal Co. Ltd.

To conform with the designations in general use throughout other Regions of British Railways, the titles of Divisional Engineers, Chief Civil Engineers' Department, Southern Region, have been altered as follows:—

Divisional Engineer (London East) to be District Engineer, Purley.

Divisional Engineer (London West) to be District Engineer, Woking.

Divisional Engineer (Southern) to be District Engineer, Brighton.

Divisional Engineer (Eastern) to be District Engineer, Ashford.

Divisional Engineer (Central) to be District Engineer, Eastleigh.

Divisional Engineer (Western) to be District Engineer, Exeter.

Titles of the Divisional Superintendents in the Commercial and Operating Departments, Southern Region, have been altered as follows:—

Divisional Superintendent (London East) to be District Traffic Superintendent, Orpington.

Divisional Superintendent (London Central) to be District Traffic Superintendent, Redhill.

Divisional Superintendent (London West) to be District Traffic Superintendent, Woking.

Divisional Superintendent (Southern) to be District Traffic Superintendent, Southampton.

Divisional Superintendent (Western) to be District Traffic Superintendent, Exeter.

Ministry of Transport Accident Report

Near Witham Junction, March 7,
1950: Eastern Region, British Railways

Brigadier C. A. Langley, Inspecting Officer of Railways, Ministry of Transport, inquired into the collision which occurred during a fog near Witham Junction at 3.11 a.m. on March 7, 1950, when the 11.0 p.m. express passenger mail train, Peterborough to Liverpool Street via Ipswich, consisting of a 4-wheel van and 9 bogie vehicles, drawn by a Class B.1 4-6-0 type engine and travelling at about 60 m.p.h., overtook the 7.45 p.m. Class A mineral freight train, Whitmoor to Witham, composed of 34 wagons and brake van drawn by a 2-8-0 engine, which was approaching the outer home signals slowly, preparatory to entering a loop line.

The collision was a severe one and the engine of the express veered to the left and ploughed through a shallow cutting for some 100 yd., while the first four vehicles overran it and suffered heavy damage; the body of the second was swept away. The third and fourth mounted the debris of the freight train, but fortunately the Buckeye couplings held and there was no telescoping. The van and last seven wagons of the freight train were demolished and 14 others damaged. About 100 yd. of the up line were destroyed and signal and telephone communication interrupted. The guard of the freight train and fireman of the express were killed. Of the 20 passengers and postal staff seven received minor injuries. The driver and second guard of the express were injured, the former so seriously that he could not give evidence before Brigadier Langley for eleven weeks. Assistance was promptly summoned and quickly arrived. Both lines were again open for traffic by about 6 p.m. the same day.

It was fine and mild, with a waning moon, but intermittent fog had been growing in intensity during the night. The diagram on page 78 shows the lines, signals, and so on essential to an understanding of the case. There are not many landmarks by which a driver can locate his position in fog, but some overbridges, level crossings, and other details, such as platforms, give some assistance in doing so. All relevant signals can be seen at long range in clear weather, except Kelvedon distant, masked by an overbridge 270 yd. in rear. There were no special fog marks, laid down by instruction, at any signal box concerned, and certain signals were used as such. At Rivenhall intermediate box the signalman also watched some cable poles in a field opposite, which he thought to be further away than proved to be the case. All signal boxes have detonator placers, worked at Rivenhall by standard levers, easy and quick to move.

Fog Working Instruction

Instructions lay down that when the fog marking point becomes obscured, or where none is provided, fixed signals cannot be seen at 200 yd., fog signalmen must be sent for immediately and until they arrive a train may not be accepted unless "train out of section" for the preceding one has been received (Block Regulation 4(e)). In 1934 the District Superintendent, Stratford, issued a circular, still in force, dwelling on the difficulties occasioned in fog and saying: "In this respect I must draw attention to the calling of fogmen. It has

been pointed out in the past that there has been a tendency to withhold the calling out of these men until the signalman could be certain that their services were required. This has led, in some cases, to the calling of fogmen being delayed until the fog has developed intensively—which has resulted in delay to the train service in consequence of operating 'dead sections.' It is my wish, therefore, that you err towards bringing the fogmen out possibly unnecessarily rather than after the train service has been delayed pending the fogmen reporting for duty."

It was intended that this amplification of the rules would imply that "double block" working need not necessarily be enforced when fogmen were called out early, but only when visibility was reduced to 200 yd., but there was some ambiguity of wording as between this circular to stationmasters and the signalmen's own instructions regarding fog working.

Rule 94 governs the use of detonators in foggy weather under which, in certain conditions, a signalman, in addition to keeping signals at danger, must when practicable place a detonator on the rail. Where detonator placers are provided, they must be used at all times in fog when a train is to be stopped, without qualification.

Evidence: Train Movements

The driver of the freight train received clear signals at Kelvedon and estimated that he was travelling at about 20 m.p.h. He missed the Rivenhall distant, owing to the fog, intensified by steam and smoke from a down train, so he approached the home signal cautiously and found it "off." He asked the fireman to find out from the signalman the aspect being given by the starting signal and hearing the reply that it was "off" he proceeded. Travelling at about 15 m.p.h. he passed Witham Junction distant at caution and slowed down to about 8 m.p.h., at which rate he was moving when the collision occurred. This evidence was confirmed by the fireman.

The driver of the express gave different evidence to Brigadier Langley from what he had given to the railway officers two days after the accident. To them he said he was looking for the Rivenhall distant and was beginning to think he must have passed it when the collision occurred and he thought the other train was being shunted into the siding at that box; he was amazed when he was told he was near Witham. He was travelling fast and had not reduced speed, although he was surprised that there were no fogmen out. Just before the impact the driver of the express saw two red lights.

When speaking to Brigadier Langley he could not remember anything of that interview and said that he approached Kelvedon at speed and found the distant signal "off." He was sure he saw both distant and home "off" at Rivenhall, but after that recollected nothing else except seeing "two shapes like chandelier lights."

The guard heard no detonator, neither did he notice any brake application before the collision. A driver travelling as a passenger confirmed that the train was travelling at about normal speed after leaving Colchester. He thought it was moving fast at Marks Tey, considering

the foggy weather, but was not alarmed about it, and did not notice the train passing through any other place.

The Block Working

The signalman at Kelvedon, after accepting the express at 3.3 a.m., spoke to Rivenhall box, as the freight train had not cleared the section as quickly as usual. He was informed that it was passing there. Soon after, the express was accepted by that box and he cleared all signals for it. It passed, running very fast, at 3.8 a.m. Somewhat alarmed at its speed he spoke again to Rivenhall and warned the man there to pull his detonator lever. Asking if the train had slowed down he was told it was still going very fast.

The Rivenhall signalman confirmed the conversation, already mentioned, with the fireman of the freight train, whom he informed that fogmen had been sent for. He returned his distant and home signals to normal when the train was half way past his box. He waited for the track circuit to become occupied before replacing the starting signal—about 2 to 2½ min.—cleared back to Kelvedon and accepted the express.

He received a message from there that the train was "going like mad" and then heard it approaching. As it did not seem to shut off steam at his distant signal he confirmed the fact of its high speed to the other man. He pulled his detonator lever and returned to the window to get his hand lamp and give a red light, but before he could do so the train passed at speed, so he sent "train running away" and later heard the sound of the collision. He was sure he pulled his detonator lever before the express reached the machine and could not account for one of the plates carrying a fog signal being found bent afterwards.

Density of the Fog

Brigadier Langley heard a great deal of evidence concerning the density of the fog. The three signalmen involved thought visibility to be better than did the other witnesses. The patchiness of the fog and its being thicker near the ground than on a level with the signal boxes would have contributed to this fact. Worsening of conditions at about 2.20/30 a.m. led these men to agree to call their fogmen out, really in readiness for three down newspaper trains due to pass Kelvedon at 3.38 a.m. and after. At this time they did not consider that double block working was justified. The Witham Junction signalman considered the fog to be drifting, and that at 3.30 a.m. fogmen would not have been needed, although not long before it was bad enough to require them. Visibility was estimated to be from 160 to 200 yd. on the whole, but the driver and fireman of the freight train thought that on the approach to Rivenhall the range was only about 10 to 15 yd., and that the fog was very thick after the accident. Conditions had been getting progressively worse from Bury St. Edmunds, but fogmen were out only at Claydon, between Slowmarket and Ipswich; they were surprised they were not out anywhere else.

The express driver thought visibility was only 20 yd. at Colchester, improving at Marks Tey, and becoming bad again at Kelvedon, where he caught only a fleeting glimpse of the signals, which he located

by nearby landmarks. The fog was very bad also, he considered, at Rivenhall, and he thought that fogmen should have been out from Colchester onwards. The guard of the express estimated visibility directly after the accident at about 100 yd.—the second guard thought it less—and the driver travelling as a passenger said he could see only from 15 to 20 yd. Other evidence showed the fog to have been growing in intensity from 12.30 a.m. and to have been very thick around Witham and Rivenhall. A lengthman, called out at about 2.35 a.m., found visibility only 15 yd. about 20 min. later, but it was a little clearer when he reached Rivenhall box as the express passed.

Examination of the plates of the detonator placer at that box showed the mechanism to have been operated presumably as the train was passing; the second detonator reached the rail and was exploded normally.

Inspecting Officer's Conclusion

Brigadier Langley is satisfied that all the Kelvedon signals were at clear for the express and that Witham distant signal must have been at caution. Evidence on the aspect of the Rivenhall signals was, however, not conclusive. The express driver made a coherent statement 48 hr. after the accident that he was looking for the Rivenhall distant when the collision occurred, and he expressed astonishment when told that it happened near Witham. Eleven weeks later he could not recollect this interview and denied having passed the Rivenhall signals at danger. He said he saw both distant and home off, though he did not remember the aspect of the others. The signalman there was, however, emphatic that he replaced all signals behind the freight train. If so, he could not have cleared the starting signal again, as it would have been track-locked; the distant would thus be held at caution.

Brigadier Langley considered the possibility of this signalman being late in replacing the signals and accepting the express before doing so. If his evidence is accepted at face value he could not have replaced the starting signal until between 3.8 and 3.10 a.m., by which time the express must have been at, or past, the distant. If the signalman waited to replace all three signals together the distant might well have been "off" for the express. The signalman was an intelligent young man, at Rivenhall for two years, on the alert on this occasion, with nothing to distract him, and Brigadier Langley sees no reason to suppose that he did not carry out correctly the normal and practically automatic routine. He feels sure that he did not give "train out section" and accept the express before replacing the signals, and considers the more probable cause of the accident to have been the express driver's failure to observe the Rivenhall signals. His conflicting statements are not surprising, considering his bad injuries. He only just saw the Kelvedon signals, all located by good landmarks.

The Rivenhall distant stands in the open 700 yd. ahead of the only easily recognised point, a public level crossing. It would be easy at high speed in fog to miss the lights of this signal and the home signal. No brake application was made at the Witham distant, 640 yd. in rear of the point of collision. This was undoubtedly at caution. It is considered that the driver was travelling too fast for proper observance of signals and is to be held primarily responsible for the collision. He is 56, with 38 years' service, ten as driver, and has a clear record.

The Rivenhall signalman must accept some responsibility, as evidence makes it clear that the fog had become so dense in that area that fogmen should have been at their posts or "double block" working have been in force. This man realised that the fog was getting bad and had called the fogmen out, though for the purpose of getting them in position for the newspaper trains. He made a serious error of judgment in not instituting double block immediately after the freight train passed, especially as the fireman's queries should have warned him that visibility was deteriorating. He also failed to operate the detonator placer in time, and Brigadier Langley, in spite of some conflict of evidence, is satisfied that he did not think of it until reminded from Kelvedon, and then waited until the train was at his box. He thus failed to observe Block Regulation 4(e) and Rule 94. Had he complied with the former he would not have given "line clear" to Kelvedon, and the signals there would have been against the train, while, had the detonators been placed in time, the driver should have heard the warning. This signalman is 30, with 3½ years' service, all in that position, and a clear record.

Although conditions were better at Kelvedon the signalman there would have been well advised to have instituted double block behind the freight train. Both drivers saw the signals there only at short range and were helped by well-known landmarks. Brigadier Langley doubts, therefore, whether visibility from the footplate was as much as the 200 yd.; minimum for normal working. The box is 13 ft. above rail level and the signalman was probably misled regarding visibility by the moon shining on the ground mist. He was alert, however, and took commendably prompt action when the express passed at such high speed.

Remarks

This accident has drawn attention once again to the desirability of providing the warning type of automatic train control at the distant signal, at present confined to the Western Region and the London-Southend line, Eastern Region, but the British Transport Commission's annual report for 1948 has accepted its wider extension as an ideal at which to aim. Preparations are nearly complete for large-scale experiments with improved apparatus between new Barnet and Huntingdon with 65 engines. It is hoped that on their successful conclusion the progressive equipment of all important lines will be given high priority in the allocation of available resources.

The particular value of automatic train control in fog, especially before fogmen reach their posts, requires no emphasis. The need for special caution at this time has long been recognised and Block Regulation 4(e) has been framed accordingly to provide for "double block" working. This restriction naturally has an adverse effect on heavy traffic and the Stratford District Superintendent's circular letter in 1934 was intended to reduce delays as much as possible by allowing fogmen to be sent for early.

The signalmen concerned in this accident undoubtedly acted in accordance with this circular when they called out the fogmen for the newspaper trains, but their decision not to institute "double block" working may have been unduly influenced by their desire not to delay traffic. To avoid ambiguity, instructions applicable to all Regions have now been issued, so as to allow for fogmen to be called out in

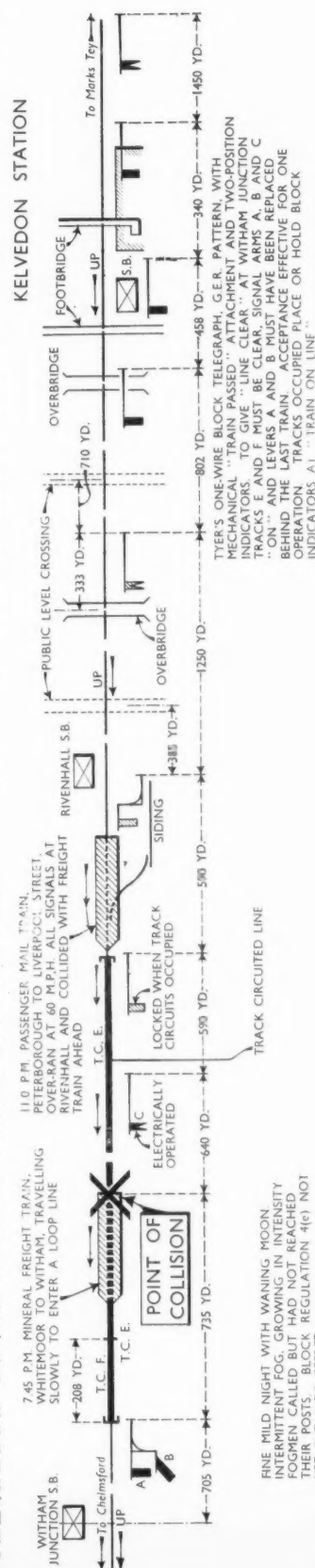


Diagram showing circumstances of accident near Witham Junction on March 7, 1950

anticipation of worsening conditions in areas of dense traffic, but at the same time to make it clear that whenever visibility is reduced to 200 yd. "double block" working must be introduced immediately unless the fogmen are actually at their posts.

There were no proper fog marking points at Keldvedon and Rivenhall and the signals used for this purpose were so far from the box that both signalmen had to rely largely on their own judgment and select other nearer points to assist them. The signalman at Rivenhall clearly misjudged conditions by relying on seeing in the moonlight a pole only 117 yd. away. This unsatisfactory state of affairs has now been changed, and ground signals approximately 200 yd. from each box have been selected in place of the original ones. General instructions have also been issued that, when practicable, fog marking points should be selected as near as possible to the distance of 200 yd. from the box, and visible at driver's eye level, and that these points should be notified through the signalmen's special instructions. A proviso has been added that when it is not possible to lay down specific points, signalmen must work to a distance of 200 yd. They ought not to be expected to judge distances in fog without some guide to help them, and it is considered that specially lighted fog markers, as used on some Regions, should be erected in those places where there are no suitable structures or signals at the correct distance.

Institution of Railway Signal Engineers

At a meeting of the Institution of Railway Signal Engineers in London on December 13, 1950, a paper on centralised traffic control, by Mr. J. W. Porter, New Zealand Government Railways, was read on his behalf by Mr. J. Sulston. Mr. F. Horler, President, was in the chair.

The paper, which was referred to in an editorial note in our January 12 issue, dealt with the economic and operating conditions involved in the use of this type of equipment, described typical apparatus and methods of circuit control, questions of power supply, features of working involved in New Zealand, functioning of certain forms of installation, and details of maintenance and fault finding, with general considerations on future development and design.

The discussion was opened by Mr. E. G. Brentnall, who spoke of the operating conditions required to render such working practicable and economic. The use of C.T.C. apparatus had been considered more than once in this country, but it had not been found possible to discover where its use could be justified, although it had been suggested that certain sections in Scotland and elsewhere would be suitable. Here, where installations were comparatively concentrated, some form of remote control might be applicable in places, but the C.T.C. system had generally been applied successfully to long single lines with loops and some supervisory traffic movement control over an entire section of route.

Mr. J. E. Mott thought it would be difficult to evaluate some of the items bearing on the problem of effecting a saving. The system was considered to offer advantages on sections where conditions made it difficult to house operating staff. Probably one of the chief concerns would be what happened if any disturbance of the line circuits occurred.

Mr. J. O. Sims said the New Zealand

lines had done fine pioneer work. Conditions varied and in India they had a high traffic density on lines worked by electric token. C.T.C. might be an alternative to doubling a line. Traffic density was a deciding factor.

Mr. C. F. D. Venning thought that apprehension about complications might explain the fact that C.T.C. was not yet in use in Great Britain. The reliability of the apparatus was now more than proved. It had been applied recently in France to reversible line working. New Zealand had been one of the first countries outside America to grasp the possibilities of the system and equipment using the unit type of construction has been supplied to Western Australia. An interesting feature of the New Zealand work was the use of local relay interlocking panels for the controlled operation of siding points, normally locked while through working was in use. There was no real reason why C.T.C. line circuits should be more vulnerable than any others, but cabling was now being used in places.

Major A. N. Stacey referred to the fact that the grade of porter-signalman had an influence on the economics of any proposal to use C.T.C. He had thought that the old Highland line north of Inverness might offer a suitable location for such equipment. There might be something too in applying C.T.C. to four-track sections such as Woking to Basingstoke.

Mr. J. C. Kubale said that he had

recently seen the work described, and had been much pleased at the progress made in New Zealand, where an active signal organisation was backed by an enthusiastic management.

Mr. H. J. N. Riddle maintained that if the problems connected with its installation and maintenance could be solved in New Zealand they could be met anywhere in the world. The terrain there was unusual and there were earth tremors and other disturbances which rendered the maintenance of lines hazardous.

Mr. L. W. H. Lowther supported other speakers in hoping that there might be some work of this type carried out in Britain which could form an example to overseas visitors of what our signal industry could do. C.T.C. introduced nothing essentially different from ordinary signalling. Similar methods of control were applied in connection with power stations and substations in electrical transmission and there could be no question of their reliability. C.T.C. was a supervisory control applied to railway signalling.

Mr. F. B. Egginton recalled that the Institution had inspected the small installation provided between Wembley Park and Stanmore which had now been replaced by other arrangements.

Mr. F. G. Hathaway emphasised that the Stanmore installation had worked well and was only removed when the layout had to be enlarged and brought into line with later London Transport standards.

The Midland Railway Co. of Western Australia Ltd.

Increasing expenses adversely affect railway operating results

The annual general meeting of the Midland Railway Co. of Western Australia Ltd. was held in London on January 11. Mr. Robert W. Adeane, Chairman, presided, and in the course of his speech said that a year ago he had told stockholders that the increase in rates would not offset the increase in expenses, and he regretted to say that that warning had been fully warranted.

Of the increase of £54,000 in working expenses, £22,000 related to expenses on maintenance which in previous years had been charged to renewals. The remaining £32,000 was spread over all departments and emanated from the continued rise in wages and cost of all materials.

So far as the railway was concerned, the number of passengers had again decreased, and this year also the number of livestock had decreased and the wheat tonnage had declined by 16 per cent. On the other hand, goods tonnage had increased and a larger proportion of higher rated goods had been carried.

It really was the railway operating that gave them cause for concern. While road service results were included in the figures he had dealt with they were swamped by the railway operating results. Considered alone, road service results were very satisfactory, and the management in Australia were to be complimented on their initiative in developing this side. The road service mileage had increased by 15 per cent., earnings by nearly 26 per cent., while working expenses were only 14 per cent. higher and net receipts had increased by 53 per cent.

He would, however, offer a word of warning that there was only a limited amount of further expansion possible within their own zone and they did not

think it politic to go outside their own zone. The limit of expansion might be reached during this year, and further increases from road services must not be relied on to solve the position.

The fact that they could only pay six months' interest on the second debenture stock showed how unsatisfactory were the railway operating results, assisted though they were by the road service operations. His visit to Australia had convinced him that fresh money, though not on a considerable scale, would be required by the company to keep the line in good repair and to continue to give services which were reliable and competitive with the State Railways. The board had under consideration an increase in the amount of first debenture stock.

The prospects for the current year would be favourable were it not for the further increase of £1 a week in the basic wage which had effect from December 1 last. That increase, coming on top of the steadily rising level of wages, was such that nothing but a very considerable increase in rates could enable them to operate at a profit.

The report was adopted.

BROWN BAYLEY STEELS LIMITED.—At a meeting of shareholders of Brown Bayley's Steel Works Limited on January 8 the sale of the entire steel business to a new wholly-owned subsidiary company called Brown Bayley Steels Limited was approved. The sale becomes effective immediately and includes the taking over by Brown Bayley Steels Limited of all the liabilities and obligations of the former company in so far as they relate to the steel business.

Staff & Labour Matters**Railway Wage Claims***Conclusion of hearing by special court of inquiry*

When the special court of inquiry, Mr. C. W. Guillebaud presiding, resumed its hearing on January 10, Mr. J. G. Baty, General Secretary of the A.S.L.E.F., replied to points made the previous day by Mr. W. P. Allen, Member of the Railway Executive. The limit of practicability in wage restraint, he said, had been passed, in view of the cost of living, which had risen 10 points since the last wage increase to the great majority of his Society's members. He pointed out that superannuation and sick pay, which Mr. Allen had cited as benefits enjoyed by railwaymen, applied to very few locomotive men.

Firemen, continued Mr. Baty, could not afford to accept promotion away from their home stations because of housing and financial considerations. No word or figure put forward by the Executive had shaken his Society's case. Maximum rates were very important; it was simply playing with the subject of relativity to talk about intermediate rates. In the nine months to September, 1950, 8 per cent. of firemen, 46 per cent. of cleaners, and 34 per cent. of junior cleaners had left the railway service of their own accord. The A.S.L.E.F. claim was based on wage rates, not earnings, which latter had been dragged in to obscure facts such as that of £6 18s. a week as the highest rate of pay for a veteran driver.

Railway Executive's Conditions

"Calling up," said Mr. Baty, was necessary to prevent men from oversleeping, for sometimes men's womenfolk had to sit up for this purpose. Lodging turns were causing tremendous dissatisfaction; re-organisation would result in a better and more economical system than that put forward by the Executive. He opposed the proposal to introduce a 9-hr. roster. Overtime, he said, was a normal feature universally acknowledged. Why, therefore, ask for additional time on schedule? The attachment of conditions to its pay offer by the Railway Executive was unconstitutional and generally acknowledged as definitely contrary to all past practices based on the negotiating machinery.

For the R.C.A., Mr. G. B. Thorneycroft, General Secretary, said the railways were getting salaried staff only where there was a surplus of labour. Mr. Allen's statement that average earnings usually were much higher than nominal was misleading; there were many salaried staff who had to rely on basic pay. At the moment the staff were suffering from a sense of bitter disappointment.

N.U.R. Viewpoint

Mr. General Secretary of the N.U.R., Mr. J. B. Figgins, after referring to the rise in the cost of living, said that without a satisfactory wage structure there could be no efficiency. He alluded in passing to the St. Pancras Goods Station strike: "We have told these men," he said, "that we stand by the policy of integration, and they must return to work." His union was not responsible for the failure to carry out the agreement for the abolition of van guards in London. The Executive had not carried it out. The N.U.R. was not opposed in principle to the 9-hr. roster; under the national agreement of 1922 this had been agreed. As for lodging turns, the N.U.R. was prepared to consider them in joint consultation.

The N.U.R. proposals would not give the ordinary railwayman the feeling he was getting a square deal, or engender the outlook which should exist to attain the greatest co-operative effort. The only way to do this was by conceding the 10 per cent. application, which restored the relativity disturbed by conditions between June, 1947, and the present.

Continuing, on January 11, with the N.U.R. case, Mr. Figgins referred to great discontent among railwaymen regarding the non-effectiveness of rest-day arrangements; the N.U.R., he said, continued to protest at the failure of the Railway Executive to implement the agreement made in October, 1947. Comparing railwaymen's wages with those in outside industries, he said that in 1938 railwaymen's average earnings were only 5d. below those of other workers, whereas today they were 10s. lower. If they were to recruit staff, the minimum wage must attract men with a railway outlook.

Cost of Railway Unions' Claims

Replying for the Railway Executive, Mr. Allen said the annual estimated cost of the three unions' claims would total £17,000,000. The application of the R.C.A. would cost some £2,500,000 a year; that of the A.S.L.E.F. approximately £5,500,000; and that of the conciliation, omitting locomotive staff, would cost £9,000,000 a year. The cost of concessions which had been made to the staff since January, 1948, amounted to £9,500,000 a year.

The industry could not possibly get into a position in which high wages and salaries could be paid unless it first improved in productivity and abolished all waste which existed in every department. He did not suggest that the unions were supporting the existence of waste, but it was a little difficult to see what was being done actively to eliminate it.

Mr. Allen paid a tribute to the efforts then being made by the N.U.R. to end the St. Pancras Goods strike. Regarding relativity of wages, it was quite impossible to restore this to the degree existing in 1939, which would be exorbitant. He pleaded for re-consideration by the unions of the necessity for calling up. Lodging turns, he said, were necessary for successful operation, speeding up of working, and economy of manpower.

Cost of Executive's Wage Offer

In reply to a question by the Chairman, Mr. V. Radford, Chief Financial Officer, Railway Executive, stated that the cost of the wage increases which the Executive had offered in reply to the unions' claims would be between £6,500,000 and £7,000,000 a year, and would affect some 460,000 out of 600,000 railwaymen.

Asked by the Chairman if it would be possible to cover further wage increases by increased railway charges, or whether this would drive more traffic to the roads, Mr. Radford said that if charges were increased, considerable provision would have to be made for loss of traffic.

Possible Increase in Rail Charges

The question of increased charges, said Mr. Radford, had not yet been considered. Points that would have to be borne in mind were the marginal spending power of the public and the effect of increases on

road competition. Increased freight charges had been introduced in May, 1950, and the trading community would certainly not look kindly on any new increase. At that time no increases had been made in passenger fares because it had been estimated that no increase in gross receipts would accrue. Revenue from passenger travel in 1950 had been £16,000,000 less than in 1948. Road transport of freight was a serious competitor. "C" licences had increased from 300,000 to 670,000. Although there had been a marked increase in industrial production since 1948, it was not possible to find this reflected to the same extent in railway carryings.

Closing the public meetings of the court, Mr. Guillebaud said the proceedings had abundantly justified the decision to hold them in public.

The court is to make recommendations which will not be binding upon the parties.

London Goods Depot Strike

The unofficial strike of goods and cartage staff at St. Pancras Goods Station, reported in our last week's issue, has spread to Camden Town, Nine Elms, and other depots in the London area. Sir Eustace Missenden, Chairman of the Railway Executive, has issued a warning to the strikers. "The stoppage," he says, "is having a most harmful effect on railway business. If it continues, or is extended, it will result in permanent loss of traffic and reduced employment."

A meeting has been arranged for today (Friday) between the Railway and Road Haulage Executives and the transport workers' unions concerned. The unions will seek an agreement with the Executives to safeguard members against unemployment which they fear might be caused by integration of road and rail services.

Mr. W. P. Allen, Member of the Railway Executive, on January 16 conferred with representatives of the N.U.R., and it was decided to postpone introduction of the new terminal procedure until January 29.

Pay Increases for Bus and Tram Workers

In response to a T. & G.W.U. claim the London Transport Executive has offered to increase the pay of bus, tram, and trolleybus workers. Drivers and conductors of Central Buses will get increases of 7s. a week, and for country buses the increases are 8s. 6d. a week for drivers and 9s. 6d. for conductors. In addition, bus, tram and trolleybus workers employed by private companies and municipal undertakings in the provinces are to receive wage increases; with the exception of labourers, all grades, including drivers and conductors, will receive an additional 7s. 6d. a week. The tribunals have awarded labourers increases of 6s. 6d.

HADFIELDS LIMITED.—The profit of the Hadfield group for the year ended September 30, 1950, after all charges including taxation, was £221,546 (for the previous year, £332,092). The net profit includes a balance of profit now ascertained on ordnance contracts, with iron and steel prices fund claims both in respect of previous years amounting to £124,948 (£161,206). The final ordinary dividend is 12½ per cent., making 17½ per cent. (as for the previous year), which absorbs £103,778.

Testing Escalator Handrail Joints

Apparatus used by London Transport Executive for reproducing conditions met with in service

For some time London Transport has been considering the production of a more satisfactory joint for escalator handrails and new types have been developed. Before adopting any new type generally it is essential to know whether it will stand up to service conditions for a minimum period. This should be at least five years, and to obtain any positive results from a normal service test would entail long delays.

The joint of a handrail in service is subjected to strain in three ways:—

(1) Direct tension, produced by the driving force on the rail.

(2) Bending, due to its passage round the driving wheel at either end of the machine and over the curved tracks at top and bottom.

(3) Twisting, where the joint passes round the tensioning gear, one wheel of which is at an inclination to the plane of the other wheels.

The reversals of stress produced by the combined effect of (2) and (3) could result

in time in the failure of a joint as the result of fatigue.

The testing machine consists essentially of two newel wheels of the same size as those used in an escalator handrail drive, one wheel being set at an angle to the other, and two curved lengths of track over which the handrail passes. Thus, the machine produces both the two-directional bending and the twisting actions which occur in service. The inclined wheel is fitted with tensioning gear to enable the joint to be run under the same tension as in service; the other wheel is driven, through gearing, by an electric motor.

The machine is fitted with a length of handrail, incorporating one or more joints to be tested, and run continuously until one of the joints fails. A record is kept of the number of hours run. The handrail is run at 925 ft. a min., compared to 180 ft. a min. in service, and because of the shortness of the rail bending and twisting occur much more frequently than in

service. The result is that by non-stop running the effect of five years' service can be produced in some three weeks.

Because of the high speed at which the test handrail runs, considerable heat may be generated and a special graphite lubricant is periodically applied to the handrail track to keep down the temperature of the handrail, which contains rubber. The machine not only permits the relative merits of various joints to be compared, but also enables a series of tests to be carried out in a reasonable time on one particular joint to confirm that results are consistent; thereafter the joint may be periodically tested to ensure that the material supplied is in accordance with specification.

SIEMENS AND GENERAL ELECTRIC DRAMATIC SOCIETY.—On January 12 and 13, the amateur dramatic group of the Siemens and General Electric Railway Signal Co. Ltd. gave two performances of the comedy "Fools Rush In," by Kenneth Horne, at Hirst Hall, G.E.C. Estate, Wembley. The acting reached a high standard and the production was skilfully handled under the direction of Mr. E. Graham Henderson.

Snow Scene on the Southern Region



"Merchant Navy" class locomotive No. 35018. "British India Line" hauling the "Bournemouth Belle" at speed near Fleet, after the first snowfall on December 15, 1950

Photo]

[E. C. Griffith

Contracts & Tenders

Davey, Paxman & Co. Ltd. are supplying the engines for 18 diesel-electric shunting locomotives, which were recently ordered from the British Thomson-Houston Export Co. Ltd. by the Western Australian Government Railways. The engines will be similar to 20 on order from Davey, Paxman & Co. Ltd. for 10 mixed-traffic locomotives for the New South Wales Government Railways. The engines are 12-cylinder, Mark "12 RPH," rated at 500 h.p.

The Indian Government has recently placed a contract with the North British Locomotive Co. Ltd. for 100 "YP" class 4-6-2 locomotives.

Notes and News

Outdoor Staff Required by an Insurance Organisation.—An insurance organisation with extensive connections in the transport industry has vacancies on its outdoor staff for a number of young men. See Official Notices on page 83.

Glasgow to Oban Dining Car Service.—The Scottish Region of British Railways announces that commencing on February 1 a dining car will be run on the 12.5 p.m. train from Oban to Glasgow and also on the 5.10 p.m. train from Glasgow Buchanan Street to Oban.

Demonstration of Neon Sign Development.—A recent development of the conventional neon sign was demonstrated by Neogram Limited, Terminal House, Victoria Street, London, S.W.1, in London on January 10. The standard Neogram consists of a metal case enclosing a ferro-magnetic plate and individual letter or characters with magnets attached can be fixed in any position. The case cover when opened disconnects the electrical supply by means of an automatic safety switch, and when closed, protects the characters; a "flash-

ing" device can be incorporated. Standard models are suitable for 200-250 V. 50-100 cycle a.c. mains, while special models can be supplied for different voltages and frequencies, including d.c. battery-operated sets, are available.

East Kent Road Car Company.—Presiding at the annual general meeting on December 28 of the East Kent Road Car Co. Ltd., the Chairman, Mr. R. P. Beddow, referred to the effects of the increased tax on fuel and to rising costs, which might result in a general fares increase. Regarding nationalisation of passenger road transport, he was glad to say that no Area Scheme had yet been approved; no case had been made, or attempted to be made, to show that any advantage could possibly accrue to the travelling public.

Institute of Traffic Administration.—The 1951 annual conference of the Institute of Traffic Administration will be held from May 25 to 27 at the Grand Hotel, Manchester. Proceedings will open with the annual general meeting on the evening of May 25, and this will be followed by a paper. On the morning of May 26, there will be a paper, and in the afternoon a visit to a Manchester transport installation; in the evening the annual dinner will be held. On Sunday there will be a meeting of the National Council, and, for other members, a tour of local interest.

International Container Exhibition.—The International Container Bureau and the Verkehrshaus der Schweiz are organising an exhibition of containers on April 14-22 at Zurich-Tiefenbrunnen on a site beside the Lake of Zurich. The exhibition will include demonstrations in ships and road vehicles. On the opening day, April 14, a series of lectures will be given at the Zurich Kongresshaus, and during the exhibition, meetings will be held in Zurich: (a) Meeting of delegates of member Governments of the C.I.M. for drafting *International Regulations for Conveyance of Containers by Rail*, for insertion in the

C.I.M.; and (b) Spring meeting of the Executive Committee and Work Commissions of the I.C.B. All the European administrations and enterprises concerned with containers will therefore be represented at Zurich. Facilities will be granted by the railways for conveying exhibits, and for travel by exhibitors to and from Zurich. Further information may be obtained from Mr. W. Zurcher, International Container Bureau Permanent Delegate in Switzerland, Barengasse 29, Zurich.

Indian International Engineering Exhibition.—About 500 delegates representing 38 countries attended the opening on January 10 of an Indian international engineering exhibition in Delhi by Mr. N. V. Gadgil, Minister for Mines, Works, & Power. The exhibition, the first of its kind in the East, is being held simultaneously with the meetings of three major international engineering organisations—namely, the world power conference, the international commission on irrigation and canals, and the international commission on large dams. Among British delegates are Lord Citrine, Chairman of the British Electricity Authority, Sir Vincent de Ferranti, Chairman of the World Power Conference, and Sir Arthur Fleming.

Overcoming Restrictions on Private Road Hauliers.—Manchester Chamber of Commerce has announced that the effect of nationalisation restrictions which confine private road hauliers to a working radius of 25 miles is being overcome by a system of interworking which allows private owners to handle thousands of tons of traffic. The Chairman of the road transport section of the Chamber said that groups had been formed in various towns to provide the widest possible transport service within a 50-mile radius, including return loads. Hauliers are to campaign for the 25-mile radius to be raised to 60 miles.

Glyn, Mills & Company.—The report for the year ended December 31, 1950, of Glyn, Mills & Company shows that the profit, after providing for tax and making a transfer to reserve for contingencies, was £151,506 (against £152,854 for 1949). To this is added the balance brought forward from 1949, £33,944, making a total of £185,450 (£171,394) out of which appropriations have been made: interim dividend at 7½ per cent. paid on August 15, 1950 (as for the previous year), £79,500, less tax, £35,775; and additional transfer to reserve for contingencies, £50,000, leaving a sum of £91,725. From this the directors propose to pay a final dividend of 7½ per cent. (as for the previous year), amounting to £79,500, less income tax, £35,775, leaving a balance to be carried forward of £48,000 (£33,944).

Permanent Way Institution: Tablet Unveiled.—A special meeting of the Permanent Way Institution was held at the Granby Hotel, Nottingham, on January 13, for the unveiling of a tablet in the room where the meeting of permanent way inspectors was held on January 5, 1884, when the decision to inaugurate the Institution was made. Mr. J. C. L. Train, President of the Institution, performed the unveiling ceremony. Mr. J. C. Loach, Nottingham & Derby Section of the Institution, presided, and mentioned that the original aims and objects as agreed at the meeting in 1884, when the late Mr. W. L. Meredith was elected President for the first year, were still in force today, showing the foresight of the founders. Among those present was Mr. S. L. Murgatroyd, who joined the In-

Locomotive for South Bank Exhibition



Diesel-electric locomotive of 660-h.p. passing through St. Albans on its way from the Vulcan Foundry works at Newton-le-Willows to London for display at the Festival of Britain before being shipped to Tasmania

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RAILWAY MAINTENANCE PROBLEMS. By H. A. Hull (late District Engineer, L.M.S.R.). Valuable information. With much sound advice upon the upkeep of permanent way. Cloth. 84 in. by 54 in. 82 pp. Diagrams. 5s. By post 5s. 3d. *The Railway Gazette*, 33, Tothill Street, London, S.W.1.

AN Insurance Organisation with extensive connections in the transport industry has vacancies on its outdoor staff for a number of young men. Excellent opportunities to those possessing good personality and anxious to succeed.—Box 955, *The Railway Gazette*, 33, Tothill Street, London, S.W.1.

RAILWAY SIGNALLING AND COMMUNICATIONS INSTALLATION AND MAINTENANCE. A practical guide, especially intended to help Signal Inspectors, Installers, Fitters, Linesmen, Draughtsmen, and all concerned with installing and maintaining Signal, Telegraph, and Telephone Equipment. 416 pp. Many illustrations. Cloth. 8s. By post 8s. 6d. *The Railway Gazette*, 33, Tothill Street, London, S.W.1.

INTERNATIONAL RAILWAY ASSOCIATIONS. Notes on the work of the various associations concerned with International traffic, principally on the European Continent. 2s. By post 2s. 2d. *The Railway Gazette*, 33, Tothill Street, London, S.W.1.

TRANSPORT ADMINISTRATION IN TROPICAL DEPENDENCIES. By George V. O. Bulkeley, C.B.E., M.I.Mech.E. With chapters on Finance, Accounting and Statistical Method. In collaboration with Ernest J. Smith, F.C.I.S., formerly Chief Accountant, Nigerian Government Railway. 190 pages Medium 8vo. Full cloth. Price 20s. By post 20s. 6d. *The Railway Gazette*, 33, Tothill Street, London, S.W.1.

stitution in 1885 and became President in 1896, and who gave some interesting details showing what the railways in Britain were like 67 years ago. Mr. J. Taylor Thompson, past-President, proposed a vote of thanks to Mr. Train and expressed appreciation of the résumé of early railway developments given by Mr. Murgatroyd.

Western Region London Lecture & Debating Society.—Mr. H. Randle, Carriage & Wagon Engineer, Western Region, will read a paper on "The Design and Construction of Rolling Stock" to British Railways, Western Region, London Lecture & Debating Society, on February 1. The meeting will be held at the Headquarters Staff Dining Club, Bishop's Bridge Road, Paddington, at 5.45 p.m.

Customs Examinations in International Rail Traffic.—Representatives of European railways and customs services conferring under the auspices of the Economic Commission for Europe have drafted two international conventions to simplify and speed up customs formalities for passengers and goods at frontiers. It was agreed that currency and customs inspections should be carried out *en route* where possible. The Belgian, French, and Netherlands delegates hoped that the possibility of introducing such examinations soon in boat trains on at least one of the international services between the Continent and the United Kingdom would be considered.

Permanent Way Institution.—The 67th Annual Winter Meeting of the Permanent Way Institution will be held at the Institution of Civil Engineers, Great George Street, London, S.W.1, on January 27, at 2.30 p.m.; Mr. J. C. L. Train, President of the Institution, and Member, Railway Executive, will be in the chair. The Annual Winter Dinner of the Institution will be held the same day at the Railway Executive Headquarters, 222, Marylebone Road, London, N.W.1, at 5.45 for 6.15 p.m.; Lt.-Colonel H. B. Everard, President-Elect of the Institution, and Chief Officer, Engineering (Maintenance), Railway Executive, will preside.

Brush-Aboe Group Film.—On Tuesday evening, at the Savoy Hotel, London, W.C.2, Sir Ronald Matthews, the Chairman, and the Directors of the Brush Electrical Engineering Co. Ltd., presented the first showing of a film entitled "Power." Among those present was the Minister of Supply, Mr. G. R. Strauss, M.P. The film gives an excellent impression of the organisation, activities and products of the Brush Associated British Oil Engines group of companies in the design, production and testing of diesel engines of all powers. The companies concerned are the Brush Electrical Engineering Co. Ltd. of Loughborough, Mirrlees, Bickerton & Day Limited, of Stockport, J. & H. McLaren

Limited, of Leeds, Petters Limited, of Staines, and Henry Meadows Limited, of Wolverhampton.

Collision on Italian State Railways.—Three people were killed and 50 injured when the Rome-Turin express collided on January 9 with a train outside Leghorn. The cold weather is said to have caused short-circuiting of signals.

North British "W.G." Class Locomotive for Festival of Britain.—One hundred 2-8-2 "W.G." Class locomotives are now being built and delivered to the Indian Government Railways by the North British Locomotive Co. Ltd. One of these will be shown at the South Bank Exhibition of the Festival of Britain and it has already been shipped from Glasgow. It will arrive this weekend at the Greenland Berth of Surrey Commercial Docks and will be unloaded on January 23 by P.L.A. crane. Robert Wynn & Co. Ltd., Newport, Mon., will transport the locomotive by road to the Festival site. A special steel cradle 3 ft. 6 in. high has been built to display the exhibit. The locomotive is described in other pages this week.

Better Lighting at Level Crossings.—A deputation has been appointed by the Hull Road Safety Committee to seek an interview with the Railway Executive on the question of improved lighting at level crossings. The Chief Constable stated that the only really satisfactory answer to the dangers presented by the level crossings at night was automatic traffic signals. Pending their adoption, he suggested that suspended lights should be fixed directly over the centre of each level crossing. A red lamp, completely visible at all angles to show when the gates were being closed to road traffic, should take the place of the existing bullseye lamp. He also urged that the gates should be painted in black and white stripes, that a reflector should be fixed along the centre section, and that a bell or horn should take the place of whistles.

P.T.A. Resolution on Withdrawals of B.T.C. undertakings.—At a meeting of the council of the Public Transport Association the resignations were received of the London Transport Executive from extraordinary membership, and the Tilling- and Scottish Motor Traction-controlled group of companies. It was stated in our January 5 issue that the British Transport Commission had given last-minute instructions to these undertakings to withdraw their membership of the P.T.A. as from December 31, 1950. The Council of the Association unanimously adopted for transmission to the British Transport Commission a resolution expressing: "(a) their great regret that the British Transport Commission should have instructed the road passenger transport undertakings

under its control to resign their long-standing membership of the Public Transport Association, and (b) their strong resentment at the inconsiderate manner in which the British Transport Commission has caused the resignations to be effected."

Danish Railways Cut Services.—The Danish State Railways have curtailed services to save coal. Two express trains have been withdrawn. The price paid by the State Railways for coal in the last few months has risen from Kr. 90 to roughly Kr. 120 per ton and further price increases seem likely.

London-Tilbury-Southend Electrification Scheme.—In connection with the London-Tilbury-Southend scheme, an aerial survey is being made of the line from Fenchurch Street Station to Upney, and branches between Forest Gate Junction and Little Ilford and East Ham. The survey is being carried out by Hunting Aerosurveys Limited on behalf of the Railway Executive and the total distance involved on the main line is approximately eleven miles. The survey is on a scale of 40 ft. to 1 in. The surveys are supplied on sheets about 12 ft. in length and contain all the information normally plotted by the ordinary survey methods.

Jonas Woodhead Dividend Higher.—The directors of Jonas Woodhead & Sons Ltd. recommend an ordinary dividend of 10 per cent., and a 5 per cent. bonus, less tax, in respect of the year ended September 30. Since 1937, a regular 10 per cent. dividend has been paid, but no bonus. Subject to audit, the group profit, after meeting all charges including tax, £53,172, compares with £20,613, and U.K. tax absorbs £35,581, against £59,682. The profit attributable to the holding company is £52,898, against £23,137, the distribution taking £13,922 more at £38.672. The directors point out that the tax charge in 1949 was abnormally high owing to certain losses of subsidiaries not being available for setting off against other profits. This position has to some extent been rectified in the past year.

Hackbridge & Hewitt.—The Hackbridge & Hewitt Electrical Co. Ltd. is able to report an exceptionally busy year during which many interesting contracts for transformers and rectifiers have been completed. This company is already reaping the benefit of the extra floor space afforded by the considerable extensions to the factory and throughout the year there has been a steady increase in output. This has culminated in the production of Hackbridge transformers having an aggregate capacity of well over a million kVA., and Hewitt rectifiers having an aggregate capacity of many thousands of kilowatts. Many

rectifiers have been supplied for both home and overseas traction service, typical examples being several rectifiers for Leeds City Transport, including a 3,000-kW. equipment, three 1,500-kW. equipments for the British Columbia Electric Railway Company, two 800-kW. rectifiers for tramways in Adelaide, and two 1,000-kW. 1,650-V. equipments for a railway in Spain.

Broom & Wade Limited.—The final dividend for the year ended September 30, 1950, on the £625,000 ordinary stock of Broom & Wade Limited is 7½ per cent. This makes 11½ per cent. for the year on the £500,000 ordinary stock (equal to 22½ per cent. on £250,000 ordinary stock before the 100 per cent. bonus issue); the £125,000 ordinary stock recently issued for cash only participates in the final dividend. Ordinary dividends for 1948-49 totalled 22½ per cent. on £250,000 capital. Group profits amounted to £442,428 (£312,130), less £257,168 for tax.

Forthcoming Meetings

- January 19 (Fri.).—Carlisle & District Transport Club, at the County Hotel, Carlisle, at 7.30 p.m. "Progress of Railway Development under Nationalisation," by Mr. A. E. Hammett, Commercial Superintendent, London Midland Region.
- January 19 (Fri.).—Institution of Mechanical Engineers, Storey's Gate, St. James's Park, London, S.W.1, at 5.30 p.m. Thomas Lowe Gray Lecture on "Thirty Years' Development of Opposed-Piston Propelling Machinery," by Mr. W. H. Purdie.
- January 22 (Mon.).—Omnibus Society, at the Institute of Transport, 80, Portland Place, London, W.1, at 6.30 p.m. Presidential address by Colonel Sir Joseph Nail, "A Passenger Thinks Aloud."
- January 23 (Tue.).—Institution of Civil Engineers, Great George Street, Westminster, S.W.1, at 5.30 p.m. "The Reconstruction of Culvert No. 146, near Ayton, after its Destruction by Flooding in 1948," by Mr. John Graham.
- January 23 (Tue.).—Institution of Mechanical Engineers, Storey's Gate, St. James's Park, London, S.W.1, at 5.30 p.m. Discussion on "The Training of Craftsmen," introduced by Mr. J. Loxham.
- January 24 (Wed.).—British Railways, Southern Region, Lecture & Debating Society, at the Chapter House, St. Thomas' Street, London Bridge, S.E.1, at 5.45 p.m. "Developments in Locomotive Engineering," by Mr. R. G. Jarvis, Chief Technical Assistant for Locomotives, Southern Region.
- January 25 (Thu.).—British Railways, Western Region, London Lecture & Debating Society, and the Railway Students' Association, at the headquarters staff dining club, Bishop's Bridge Road, Paddington, W.2, at 5.45 p.m. Joint debate, "Centralised Administration of Inland Transport Systems makes for Increased Efficiency."
- January 27 (Sat.).—Permanent Way Institution, Annual Winter Meeting, at the Institution of Civil Engineers, Great George Street, Westminster, S.W.1, at 2.30 p.m. Annual Winter Dinner at the Railway Executive Headquarters, 222, Marylebone Road, London, N.W.1, at 5.45 for 6.15 p.m.

Railway Stock Market

Hopes of a cease-fire in Korea probably caused stock markets to remain active earlier in the week, with values in most sections again moving in favour of holders. Sentiment was aided not only by continued market talk of dividend increases from leading industrial companies, but also by hopes that recent fears of exceptionally big tax increases in the next Budget may not be realised. The City tends to assume that part of the cost of re-armament will be met by the issue of a big defence loan, possibly before the Budget.

No further big gilt-edged issue, however, is anticipated until after next month's issue of over £300,000,000 steel stock in connection with steel nationalisation. There have been some reactions among industrial shares, but these were not numerous, and mainly confined to companies which are large users of sheet steel; the latter is likely to become in even shorter supply because of re-armament. On the other hand, most companies which are large sheet steel users will also be prominent in re-armament work, which will in due course more than offset falling off in their usual activities.

Foreign railway stocks generally held firm. United of Havana were marked up sharply on revived hopes of a take-over offer from the Cuban Government, though there seems to be no reason to expect any early development. The 1906 debentures have risen sharply to 18 at the time of going to press, buyers coming in on the view that on any reasonable take-over terms this debenture stock would probably be worth around 30.

A moderate recovery in Manila stocks was due to hopes of a cease-fire in Korea which would improve conditions generally in the Far East. The "A" bonds rallied to 58 and the preference shares to 5s. 9d.

On the other hand, following their recent improvement, Antofagasta stocks reacted, the ordinary coming back to 7½ and the preference to 49. San Paulo 10s. units remained more active and have improved further to 16s. 6d. Great Western of Brazil shares kept steady at 15s. 6d. There was further American buying of Mexican bonds, including railway stocks. Mexican Central "A" bonds rose again to 53½; National of Mexico 4½ per cent. non-assented bonds were 36½.

La Guaira ordinary stock rose to 80 and the debentures to 96. Bolivar "C" debentures kept at 58. After coming into demand on unconfirmed take-over talk, Dorada stock at 79 lost part of its rise. Brazil Rail gold bonds were firm at 44½.

Reflecting the trend of Wall Street, Canadian Pacific, after a further rise, have reacted moderately to 45. The 4 per cent. non-cumulative preference stock was 74 and the 4 per cent. debentures 99. Nitrate Rails held firm at 73s. 9d. and Taltal shares were 15s. 6d. Leopoldina stocks have been less active, but were generally maintained in price. The ordinary was 11½, the preference 28, with the 4 per cent. debentures at 99½ and the 6½ per cent. debentures 147½. Leopoldina Terminal 5 per cent. debentures were 94½ and the ordinary units 1s. 4½d.

Changes in road transport shares were mostly small, apart from Lancashire Transport, which were marked down 5s. to 62s. 6d. West Riding moved up 1s. to 59s. 6d. Southdown were 120s. and B.E.T. deferred stock £520.

The City is now resigned to the view that the Government intends to go ahead with steel nationalisation, and that in February nationalisation steel stock will be issued in exchange for shares in companies scheduled for take-over by the State. Steel shares have again kept fairly steady. Selling by holders who had wished for a last-minute nationalisation reprieve has again been matched by buying by big financial institutions who believe that the shares offer a "cheap" means of increasing their interests in British Funds. They contend that the new steel stock will be a 3½ per cent. long-dated and issued at par, and that in the initial stages at any rate it is unlikely to go to a discount. The assumption is apparently that the authorities might be prepared, if necessary, to support the market, more particularly if they have in mind the issue of a big Defence loan later on.

Shares of locomotive building and allied companies recorded a number of gains and displayed firmness. Birmingham Wagon were 32s and Hurst Nelson 59s. 6d. Charles Roberts have been active up to 98s. Vulcan Foundry further strengthened to 26s. and Beyer Peacock were also higher at 25s. 4½d. North British Locomotive were 19s. 1½d., Gloucester Wagon 15s. 6d. and Wagon Repairs 15s. 7½d.

Traffic Table of Overseas and Foreign Railways

	Railway	Miles open	Week ended	Traffics for week		No. of week	Aggregate traffics to date			
				Total this year	Inc. or dec. compared with 1948/49		Total	Increase or decrease		
							1949/50			
South & Central America	Antofagasta ...	811	7.1.51	£ 76,760	+	£ 25,200	1	£ 76,760	+	£ 24,210
	Costa Rica ...	281	Nov., 1950	c936,206	+	c27,594	22	c5,297,269	+	c499,190
	Dorada ...	70	Nov., 1950	36,972	+	13,063	48	428,205	+	107,418
	Inter. Ctl. Amer. ...	794	Nov., 1950	\$1,059,387	+	\$34,405	48	\$12,260,819	+	\$1,125,713
	La Guaira ...	22½	Sept., 1950	\$68,726	—	\$39,529	39	\$725,533	—	\$241,943
	Nitrate ...	382	15.8.50	10,816	—	8,656	32	286,336	—	6,203
	Paraguay Cent. ...	274	5.1.51	£160,619	+	£28,284	27	£5,427,552	+	£1,560,090
	Peru Corp. ...	1,050	Nov., 1950	\$7,577,000	+	\$1,083,700	22	\$38,783,000	+	\$11,773,242
	" (Bolivian Section)	66	Nov., 1950	Bs.13,612,000	+	Bs.2,401,000	22	Bs.56,586,000	+	Bs.4,428,836
	Salvador ...	100	Oct., 1950	c87,000	—	c19,000	18	c355,000	—	c42,000
Taltal ...	154	Dec., 1950	\$1,435,116	—	\$57,262	26	\$9,256,802	—	\$1,584,101	
Canada	Canadian National†	23,473	Oct., 1950	18,063,000	+	2,947,000	43	150,250,000	+	13,286,000
	Canadian Pacific...	17,037	Nov., 1950	11,700,000	+	978,000	48	114,918,000	+	3,873,000
Various	Barsi Light* ...	167	Nov., 1950	30,142	+	2,482	35	231,667	+	6,945
	Egyptian Delta ...	607	10.10.50	18,245	+	1,296	28	319,911	—	24,005
	Gold Coast ...	536	Nov., 1950	308,361	+	29,865	35	1,959,582	+	65,411
	Mid. of W. Australia	277	Oct., 1950	42,456	+	11,690	18	153,312	+	41,071
	Nigeria ...	1,900	Jan., 1950	502,360	+	38,978	44	5,017,814	+	266,573
	South Africa ...	13,347	2.12.50	1,962,578	+	384,454	35	59,158,649	+	6,714,655
	Victoria ...	4,744	Sept., 1950	1,729,344	+	103,977	13	—	—	—

* Receipts are calculated at 1s. 6d. to the rupee

† Calculated at 83 to £1